



Containerboard Interlaboratory Testing Program

Participant Summary Report #563 (J) - August 2016

Revision Notice:

CTS discovered that some flags on the Monthly Results CPV and SD Wks were incorrectly assigned for this cycle. The statistical calculations are correct, only the flag was displayed in error. CTS notified all affected laboratories. If you have any questions, please do not hesitate to contact Kyle Kruger at containerboard@cts-interlab.com or (571) 434-1925 (ext. 115)

[Introduction to the Containerboard Program](#)

[Explanation of Tables and Definitions of Terms](#)

Analysis	Sample	Analysis Name
201	BX10	Box Compression Strength, Corrugated Boxes
202	ECT9	Edgewise Compressive Strength, Wax (T811), Corrugated board
203	ECT9	Edgewise Compressive Strength by Clamp (T839), Corrugated board
205	42D2	Mullen Burst of Linerboard, 42 lb Linerboard
207	36Z3	Mullen Burst of Linerboard, 36 lb Linerboard
215	42D2	Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard
217	36Z3	Ring Crush of Linerboard, Rigid Platen Type, 36 lb Linerboard
223	42D2	STFI of Linerboard, 42 lb Linerboard
225	36Z3	STFI of Linerboard, 36 lb Linerboard
228	56A	Roughness - Stylus Method, 56 lb Linerboard
229	42D2	Roughness - Sheffield Method, 42 lb Linerboard
231	36Z	Internal Bond Strength, Linerboard, 36 lb Linerboard
234	36Z	Coefficient of Static Friction - Inclined Plane, 36 lb Linerboard
237	36Z	Air Resistance - Gurley Method, Linerboard, 36 lb Linerboard
240	CM81	Flat Crush Strength (CMT) of Medium, 26 lb Corrugating Medium
250	CM81	Fluted Crush of Medium, 26 lb Corrugating Medium
255	CM81	Ring Crush of Medium, 26 lb Corrugating Medium
261	CM81	STFI of Medium, 26 lb Corrugating Medium

Collaborative Testing Services, Inc.
CONTAINERBOARD INTERLABORATORY TESTING PROGRAM

INTRODUCTION

The Interlaboratory Testing Program for Containerboard is operated and maintained by Collaborative Testing Services, Inc. (CTS), with technical guidance provided by the Containerboard Group of the American Forest & Paper Association. The tests are conducted on a monthly basis.

For these tests samples of linerboard and corrugating medium, that each have been separately randomized from narrow rolls, are distributed for testing weekly. One weight of medium (26 lb.) is used for Concora Flat Crush Strength, Corrugated Fluted Crush Strength, Ring Crush Strength, and STFI Compression. Two weights of linerboard are tested each month for Mullen Burst, Ring Crush, and STFI Compression: 42 lb. - every month; 36 lb. and 56 lb. - alternate months. The participants return their test results for analysis and receive a monthly report.

Please refer to the section, "EXPLANATION OF TABLES", for definitions of terms and guidelines to interpreting the results.

USE OF AVERAGE MEAN AS A COLLABORATIVE REFERENCE VALUE

The samples of linerboard and corrugating medium, which have been randomized and placed in sealed packages for distribution in this program, may be used as collaborative reference materials. The values most representative of each material are the Cumulative Grand Means in the latest reports, given at the bottom right of each table. Comparisons can only be made within one lot of material; therefore check your measurements against the Cumulative Grand Means with the same lot code as on the packages being tested.

Material	Lot Code	Dates in Use
26 lb Corrugating Medium	CM81	October 2015-Current
	CM73	December 2013-September 2015
36 lb Linerboard	36Z3	December 2014-Current
	36Z2	February 2012-October 2014
42 lb Linerboard	42D2	August 2016-Current
	42D1	April 2015-July 2016
56 lb Linerboard	56A1	July 2016-Current

ABOUT CTS

Founded in 1971, Collaborative Testing Services, Inc. (CTS) is a privately-owned company that specializes in interlaboratory tests for a wide variety of industries, including rubber, plastics, fasteners and metals, containerboard, paper, color, and wine, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality control objectives. Labs from the U.S., as well as more than 80 countries, currently participate in the CTS programs.

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EXPLANATION OF TABLES

Each analysis is divided into three time spans. On the left side of the table are the individual laboratory results for each week of the month; in the center are each lab's statistical data for the month; and on the right are each lab's cumulative data for up to 16 weeks. At the bottom of the table are the consensus statistics for all the participants for each of the three time spans.

Definitions of Terms Used

Weekly Results

Laboratory Data

- WebCode - A six character laboratory identifier used to maintain information on a confidential basis. The WebCode is unique for each cycle and will change for each report. Your WebCode can be found in your Individual Report (Current Month Performance Report) and your datasheet.
- Weekly Means - The average of the test results obtained by the participant for each week that data were reported.

Consensus Data

- Wk Mean - For each week, the average of the Means for all the participants, excluding those laboratories flagged with an 'X'.
- Avg SDr - For each week, the average of the within-laboratory standard deviations (SDr's) for all the participants, excluding those laboratories flagged with an 'X'. The Avg SDr is an indication of the variation of measurements within an average laboratory.
- SD btwn Labs - For each week, the standard deviation of the laboratory Means about the Wk Mean, excluding those laboratories flagged with an 'X'. The SD LABS is an indication of the precision of measurement between the laboratories.
- Labs Incl - The number of laboratory Means included in the Wk Mean for that week.
- Labs Excl - The number of laboratory Means reported but excluded from the Wk Mean for that week because of outlying results ('X' following Mean).
- Labs not rcvd - The number of laboratories failing to report for that week.

Monthly Results

Laboratory Data

- Mean - For each laboratory, the average of all the weekly Means reported for this month.
- CPV - **Comparative Performance Value**, an indication of how well a laboratory's Mean agrees with the other participants. The CPV is a ratio indicating the number of standard deviations from the consensus mean (Monthly Mean). The closer a laboratory's CPV is to zero, the more consistent its results are with the other participants' data.
- SDr - For each laboratory, the average of the weekly within-lab standard deviations (SDr's) for all reported Weekly Means this month.
- SD Wk - The standard deviation among the laboratory's weekly Means, including those Means flagged with an 'X'. The SD Wks is an indication of that laboratory's ability to obtain constant results from week to week.

Consensus Data

- Month Mean - The average of the Means for all the participants, excluding those laboratories flagged with an 'X,' reporting data for this month.
- Avg SDr - For the current month, the average of the within-laboratory standard deviations (SDr's) for all the participants, excluding those laboratories flagged with an 'X'.
- SD btwn Labs - For the current month, the standard deviation of the laboratory Means about the Month Mean, excluding those laboratories flagged with an 'X'.
- SD btwn Group - For the current month, the standard deviation of the laboratory Means within the group about the Month Mean, excluding those laboratories flagged with an 'X'.
- SD btwn Wks - For the current month, the average of the laboratory between week standard deviations (SD Wks') for all the participants.

Cumulative Results

Laboratory Data

Mean	- For each lab, the average of all the monthly Means reported for the weeks shown.
CPV	- Comparative Performance Value , an indication of how well a laboratory's cumulative mean agrees with the other participants. The CPV is a ratio indicating the number of standard deviations from the consensus mean (Monthly Mean).
SDr	- For each laboratory, the average of the weekly within-lab standard deviations (SDr's) for the weeks shown.
SD Wk	- The standard deviation among the laboratory's weekly Means for the weeks shown, including those Means flagged with an 'X'. The SD Wks is an indication of that laboratory's ability to obtain constant results from week to week.
Wks	- The number of weeks included in the cumulative period.
Inst	- The two letter instrument code. Codes are summarized at the bottom of the last analysis page.

Consensus Data

Grand Mean	- The average of the Means for all the participants, excluding those laboratories flagged with an 'X,' reporting data for the number of weeks included in the cumulative period.
Avg SDr	- For the cumulative period, the average of the within-laboratory standard deviations (SDr's) for all the participants, excluding those laboratories flagged with an 'X'.
SD btwn Labs	- For the cumulative period, the standard deviation of the laboratory Means about the Month Mean, excluding those laboratories flagged with an 'X'.
SD btwn Wks	- For the cumulative period, the average of the laboratory between week standard deviations for all the participants.

Any laboratory that receives a 'flag' following a mean or standard deviation should refer to the chart below for an explanation of the data flag symbol:

<u>Flag</u>	<u>Explanation</u>
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Data Flags "X" and "*" indicate a laboratory's performance on an average value differed from the consensus.

Data Flags "H" and "L" indicate a laboratory's performance on a standard deviation differed from the consensus.

Flags assigned to Weekly Means, Monthly Mean and Cumulative Mean:

- | | |
|---|--|
| X | Excluded from the weekly means, monthly means and/or the cumulative mean. Immediate review of data and/or testing procedure is recommended. |
| * | Included in the weekly means, monthly means and/or the cumulative mean; however, lab should review testing procedure and monitor future results. |

Flags assigned to Weekly Means:

- | | |
|---|---|
| H | Indicates high within-laboratory standard deviation. The laboratory SDr for each week is not shown, but laboratory average SDr and consensus average SDr values are shown. |
| L | Indicates low within-laboratory standard deviation. The laboratory SDr for each week is not shown, but laboratory monthly average SDr and consensus average SDr values are shown. |

Flags assigned to Monthly SD Wks and Cumulative SD Wks:

- | | |
|---|--|
| H | Indicates high variability between weekly means (high week-to-week variation). |
| L | Indicates low variability between weekly means (low week-to-week variation). |



Containerboard Interlaboratory Testing Program
Analysis 201

Report #563 (J)
August 2016

Top to Bottom Box Compression Strength, Corrugated Boxes - BX10

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
3AXZNK	668.2	0.08	34.3	676.0	-0.09	40.9	4	EX
4HL9T9	670.9	0.12	12.0	660.0	-0.39	41.1	4	LM
4XFVYZ	598.2	-0.80	16.2	620.6	-1.11	27.6	4	LL
7WHC4C	459.8	-2.53 *	89.2	600.3	-1.49	111.3	4	EX
96ZMCV	613.4	-0.61	63.3	666.8	-0.26	54.9	4	ES
AA8FXD	739.6	0.98	34.4	751.3	1.29	23.2	4	ER
AAB6ZP	605.2	-0.71	30.7	618.3	-1.15	35.9	4	LL
FCENR7	810.2	1.86	21.9	777.9	1.78	159.8	4	TB
GAKJAH	806.7	1.82	48.8	796.2	2.12 *	40.3	4	TE
HTVPGR	698.0	0.45	66.0	672.8	-0.15	58.9	4	ER
HZD64A	580.2	-1.02	20.9	638.5	-0.78	22.7	4	EX
KMLANL	683.8	0.28	39.1	694.3	0.25	42.3	4	LG
LCWQYF	695.2	0.42	30.6	736.6	1.02	24.2	3	XX
RUXJAV	621.9	-0.50	24.9	651.6	-0.54	36.8	4	LH
TCVE3D	662.0	0.00	22.1	649.3	-0.58	27.4	3	LG
TY6RQQ	744.0	1.03	17.8	744.5	1.17	26.3	4	LH
U2PZDW	594.8	-0.84	15.7	644.6	-0.67	33.8	4	ER
URP4XA	595.6	-0.83	70.5	652.5	-0.52	58.3	4	ER
VYG8XN	610.6	-0.64	33.4	634.9	-0.85	28.8	4	LS
XMXA46	695.7	0.43	72.3	653.7	-0.50	46.3	4	LS
XUFLG6	621.3	-0.51	21.8	663.4	-0.32	32.2	4	ET
YMRFZP	702.7	0.51	21.0	700.3	0.36	54.6	4	LM
ZK47QN	741.7	1.00	20.5	757.4	1.41	40.3	4	LG

Consensus (All Labs) Results

Month Mean	661.73	Grand Mean	680.93
Avg SDr	41.77	Avg SDr	55.50
SD btwn Labs	79.73	SD btwn Labs	54.33
Labs Incd	23	Labs Incd	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	691.27	56.42	29.54	5
Clip sealing	645.78	50.07	15.95	15
Tape sealing	692.24	201.31	30.51	3



Containerboard Interlaboratory Testing Program
Analysis 201

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Top to Bottom Box Compression Strength, Corrugated Boxes - BX10

TAPPI Official Test Method T804

Key to Instrument Codes Reported by Participants

ER	Emerson 6200 Series	ES	Emerson 8510
ET	Emerson 7200	EX	Emerson Apparatus (Model not specified)
LG	TLS / L.A.B. Validator Series	LH	L.A.B. Compression Tester Model #10610
LL	Lansmont 76-5K	LM	Lansmont 122-15k
LS	Lansmont Squeezer	TB	TMI Monitor/Compression Tester, Model 17-70
TE	Testometric M500 - 25 KN	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 202
Edgewise Compressive Strength, by T811, Corrugated board - ECT9
 TAPPI T811

Report #563 (J)
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WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
KMLANL	48.6	1.53	0.8	46.2	1.14	1.9	4	LZ
TFCLQC	46.4	1.02	1.2	46.8	1.27	1.2	3	TB
TY6RQQ	37.2	-1.07	0.9	38.5	-0.53	1.2	4	TC
UBDQYN	37.7	-0.94	1.0	37.2	-0.83	1.1	4	WK
VYG8XN	43.6	0.39	1.1	43.7	0.59	1.2	4	LC
X9Y9Q4	40.2	-0.38	0.7	35.0	-1.29	1.1	4	XX
XMxA46	39.5	-0.54	2.4	39.4	-0.34	2.4	4	EM

Consensus (All Labs) Results				
Month Mean		41.85	Grand Mean	40.97
Avg SDr		1.28	Avg SDr	1.50
SD btwn Labs		4.40	SD btwn Labs	4.59
Labs Incd		7	Labs Incd	7

Key to Instrument Codes Reported by Participants

- | | |
|--|---|
| EM Emerson 1200 Series
LZ L&W Crush Tester (model not specified)
TC TMI Monitor/Compression Tester, Model 17-37
XX Instrument make/model not specified by lab | LC L&W Crush Tester 48
TB TMI Monitor/Compression Tester, Model 17-70
WK Zwick Z005 Crush Tester |
|--|---|



Containerboard Interlaboratory Testing Program
 Analysis 203
Edgewise Compressive Strength by T839, Corrugated board - ECT9
 TAPPI T839

Report #563 (J)
August 2016

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
3AXZNK	48.3	1.04	1.1	48.3	0.90	0.8	4	TL
3C3NA3	46.9	0.56	2.1	46.5	0.22	1.8	3	TM
4HL9T9	45.9	0.24	1.1	45.4	-0.19	2.3	4	EM
4XFVYZ	43.1	-0.71	1.6	43.5	-0.93	1.6	4	LC
66V6GU	40.1	-1.73	1.1	40.9	-1.88	1.5	4	TB
7WHC4C	44.2	-0.34	2.5	47.2	0.48	1.8	3	CT
8BUALH	48.7	1.17	1.7	49.2	1.26	3.4	4	LC
96ZMCV	47.4	0.73	0.6	45.9	-0.01	1.7	4	LD
AA8FXD	40.1	-1.72	1.3	41.8	-1.55	1.1	4	EM
AAB6ZP	44.1	-0.40	1.5	44.4	-0.55	1.4	4	BU
C8VMWB	48.9	1.25	1.5	48.6	1.00	1.2	4	LC
E2ZAAD	42.5	-0.93	1.5	42.6	-1.23	2.5	4	LC
FCENR7	52.0	2.28 *	0.8	46.3	0.17	0.9	4	LD
G8GRFJ	48.3	1.02	0.6	47.2	0.49	1.2	4	EM
HD27L3	44.9	-0.10	1.4	45.0	-0.35	1.2	4	LD
HF8Q8G	44.0	-0.43	0.6	46.1	0.07	1.2	4	LC
HTVPGR	44.3	-0.30	2.3	43.6	-0.88	2.4	4	EN
HZD64A	44.5	-0.26	1.4	45.3	-0.22	1.9	4	LD
KMLANL	44.9	-0.10	2.8	44.3	-0.62	2.6	4	LE
LLZZ76	39.6	-1.88	1.1	45.1	-0.32	1.5	4	LC
MMTD73	46.9	0.56	0.9	45.3	-0.24	1.5	4	TK
NM9UYB	48.4	1.06	1.8	48.2	0.85	1.7	4	LD
PQ8KPM	45.5	0.11	1.6	45.5	-0.16	2.3	4	LD
RUXJAV	41.8	-1.16	1.8	51.6	2.14 *	2.1	4	EM
TFCLQC	47.3	0.71	1.2	47.7	0.68	1.2	3	TG
TV6BL9	43.9	-0.44	1.3	43.7	-0.85	1.7	4	LD
TY6RQQ	44.9	-0.12	1.1	43.1	-1.05	0.9	4	TC
U2PZDW	40.5	-1.58	1.0	52.7	2.56 *	4.2	4	TB
URP4XA	47.5	0.77	1.4	46.5	0.22	2.1	4	LD
VBWQY8	45.3	0.03	1.4	46.2	0.11	1.7	4	LD
VFZYWN	42.0	-1.10	2.3	42.1	-1.45	2.3	4	TD
VYG8XN	47.6	0.81	1.2	47.3	0.52	1.4	4	LC
X2E7LL	45.1	-0.04	1.4	43.7	-0.83	1.5	4	TG
X9Y9Q4	40.4	-1.63	0.5	35.0	-4.13 X	0.9	4	XX
XMxA46	46.1	0.28	1.1	46.1	0.09	1.6	4	EM
XUFLG6	51.4	2.09 *	1.4	51.8	2.25 *	1.5	4	TD
YA8X8K	44.0	-0.40	1.7	44.0	-0.72	1.7	3	EX
YMRFZP	47.0	0.61	0.9	47.9	0.77	1.0	4	TG
ZK47QN	44.1	-0.38	3.8	44.4	-0.58	2.8	4	EM



Containerboard Interlaboratory Testing Program
 Analysis 203
Edgewise Compressive Strength by T839, Corrugated board - ECT9
 TAPPI T839

Report #563 (J)
August 2016

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
ZX6YWQ	46.6	0.45	2.8	45.4	-0.20	3.0	4	LC

Consensus (All Labs) Results			
Month Mean	45.23	Grand Mean	45.90
Avg SDr	1.62	Avg SDr	1.94
SD btwn Labs	2.97	SD btwn Labs	2.64
Labs Incd	40	Labs Incd	39

Key to Instrument Codes Reported by Participants

BU Buchel Digital Crush Tester EM Emerson 1200 Series EX Emerson (model not specified) LD L&W Crush Tester 248 TB TMI Monitor/Compression Tester, Model 17-70 TD TMI Digital Crush Tester, Model 17-09 TK TLS Compression Tester, Model 5184 TM TMI/Hinde & Dausch	CT Con-Ten EN Emerson 2200 LC L&W Crush Tester 48 LE L&W Crush Tester 840 TC TMI Monitor/Compression Tester, Model 17-37 TG TMI Digital Crush Tester, 17-76 TL Tech-Lab Systems Compression XX Instrument make/model not specified by lab
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Containerboard Interlaboratory Testing Program
 Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42D2
 TAPPI Official Test Method T807

Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2C9MPK	113.4	114.1 L	113.5	112.9	113.5	1.22	7.7	0.5 L	113.5	1.22	7.7	0.5 L	4	TP
2KEPMQ	108.7	115.1	107.2	NO DATA	110.3	0.31	11.5	4.2	110.3	0.31	11.5	4.2	3	LJ
34KJUM	113.1	115.1 L	113.8	120.5 *	115.6	1.85	10.1	3.4	115.6	1.85	10.1	3.4	4	LJ
3XJZZ4	111.5	106.2	104.5	107.4	107.4	-0.55	10.1	3.0	107.4	-0.55	10.1	3.0	4	LC
4HL9T9	104.1	109.8	108.3	107.8	107.5	-0.52	9.1	2.5	107.5	-0.52	9.1	2.5	4	AH
4RB4NH	107.8	109.0	110.1	107.1	108.5	-0.23	7.7	1.3	108.5	-0.23	7.7	1.3	4	AH
6RQM9E	119.9 *	125.0 X	115.7	112.5	118.3	2.62 *	8.7	5.4	118.3	2.62 *	8.7	5.4	4	LC
7WH647	112.0	114.1	112.6	112.9	112.9	1.06	11.3	0.9	112.9	1.06	11.3	0.9	4	AX
7WHC4C	98.0 *H	104.2	96.3 *	104.2	100.7	-2.51 *	16.0	4.1	100.7	-2.51 *	16.0	4.1	4	XX
8BUALH	116.7	114.8	113.3	110.4	113.8	1.32	10.7	2.7	113.8	1.32	10.7	2.7	4	LA
8HQ4JG	109.3	111.4	111.3	108.9	110.2	0.27	10.9	1.3	110.2	0.27	10.9	1.3	4	LZ
8WBJMF	112.3	113.0	116.4	119.4 *	115.3	1.74	8.1	3.3	115.3	1.74	8.1	3.3	4	LA
96ZMCV	110.1	107.1	104.6	114.5	109.1	-0.06	11.4	4.3	109.1	-0.06	11.4	4.3	4	LA
9CYCTY	103.3	105.0	110.7	102.4	105.4	-1.15	11.0	3.7	105.4	-1.15	11.0	3.7	4	LA
9LACPV	105.1	107.6	110.5	107.7	107.7	-0.45	10.6	2.2	107.7	-0.45	10.6	2.2	4	LC
AZ4HWV	104.3	110.5	111.6	112.3	109.7	0.11	12.9	3.7	109.7	0.11	12.9	3.7	4	LA
BJEE8E	116.0	107.6	108.2	115.7	111.9	0.75	12.9	4.6	111.9	0.75	12.9	4.6	4	LC
CDKYVD	112.2	106.9	110.8	108.3	109.5	0.07	11.9	2.4	109.5	0.07	11.9	2.4	4	LA
CJB8MY	115.5	114.3	115.6	114.2	114.9	1.63	12.0	0.7	114.9	1.63	12.0	0.7	4	LA
CPEDVA	109.1	105.3	111.3	107.7	108.4	-0.27	10.7	2.5	108.4	-0.27	10.7	2.5	4	XX
CQPB9R	112.2	105.4	106.0	116.6	110.0	0.22	12.7	5.3	110.0	0.22	12.7	5.3	4	TB
CWDVET	105.0	107.4	102.3	105.0	104.9	-1.27	10.7	2.1	104.9	-1.27	10.7	2.1	4	AH
DJML6R	109.1	112.0	105.7	110.4	109.3	0.01	11.2	2.7	109.3	0.01	11.2	2.7	4	LA
E7BK38	106.7	109.2	109.5	104.3	107.4	-0.54	10.1	2.4	107.4	-0.54	10.1	2.4	4	LC
E972KV	108.1	112.5	105.1	109.1	108.7	-0.17	11.8	3.0	108.7	-0.17	11.8	3.0	4	TB
F7VDKW	112.2	112.3	116.4	113.4	113.6	1.25	12.4	1.9	113.6	1.25	12.4	1.9	4	LZ
GGLP9U	109.5	116.6	107.3 H	106.9	110.1	0.23	13.1	4.5	110.1	0.23	13.1	4.5	4	LA
HD27L3	108.8	108.7	102.8	109.5	107.5	-0.53	9.3	3.1	107.5	-0.53	9.3	3.1	4	AA
HZD64A	105.5	113.5	115.0	106.0	110.0	0.21	8.1	4.9	110.0	0.21	8.1	4.9	4	AH
HZFPYQ	114.3	108.2	112.6	107.6	110.7	0.40	10.1	3.3	110.7	0.40	10.1	3.3	4	LC
JDX2KY	113.7	111.9 L	112.7	112.7 L	112.8	1.01	4.7	0.7 L	112.8	1.01	4.7	0.7 L	4	XX
KMLANL	117.3	82.7 XL	117.5	NO DATA	105.8	-1.01	9.7	20.0 H	105.8	-1.01	9.7	20.0 H	3	LZ
KZ8M3G	110.1	100.7 *	104.3	106.6	105.4	-1.13	10.6	4.0	105.4	-1.13	10.6	4.0	4	LC
MDN42Y	115.2	105.3	107.8	108.6	109.2	-0.01	8.0	4.3	109.2	-0.01	8.0	4.3	4	AX
NCUVDF	105.3	106.6	112.8	106.2	107.7	-0.46	11.8	3.4	107.7	-0.46	11.8	3.4	4	LC



Containerboard Interlaboratory Testing Program
 Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42D2
 TAPPI Official Test Method T807

Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results				Inst	
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks		Wks
NM9UYB	109.4	111.5	109.9	111.4	110.5	0.37	9.3	1.1	110.5	0.37	9.3	1.1	4	LA
P492T3	108.5	111.3	107.9	108.5	109.1	-0.07	9.6	1.5	109.1	-0.07	9.6	1.5	4	LC
PQ8KPM	104.7	104.1	104.7	105.4	104.7	-1.33	7.4	0.6 L	104.7	-1.33	7.4	0.6 L	4	LA
QB7FRA	108.0	105.4 L	104.2 L	104.4 L	105.5	-1.10	5.0	1.7	105.5	-1.10	5.0	1.7	4	RE
RWM6MJ	109.7	108.8	103.9	112.7	108.8	-0.14	9.6	3.7	108.8	-0.14	9.6	3.7	4	TB
RZ4BLE	102.3	104.3	100.9	105.1	103.2	-1.79	9.4	1.9	103.2	-1.79	9.4	1.9	4	LC
TCVE3D	113.7	113.7	106.0	118.0 *	112.9	1.04	11.9	5.0	112.9	1.04	11.9	5.0	4	AH
TV6BL9	111.6	108.8	108.1	108.4	109.2	-0.02	10.9	1.6	109.2	-0.02	10.9	1.6	4	LC
TY6RQQ	116.0	113.3	111.3	109.0	112.4	0.90	13.0	3.0	112.4	0.90	13.0	3.0	4	AA
U2PZDW	94.4 X	99.8 *	99.8	101.5	98.9	-3.03 X	11.2	3.1	98.9	-3.03 X	11.2	3.1	4	XX
UA6CYA	113.4	112.5	105.9	109.3	110.3	0.29	9.4	3.4	110.3	0.29	9.4	3.4	4	AH
UEYALF	107.5	105.8	109.5	106.1	107.2	-0.60	10.7	1.7	107.2	-0.60	10.7	1.7	4	LA
URP4XA	110.0	108.3	108.2	106.7	108.3	-0.29	10.7	1.3	108.3	-0.29	10.7	1.3	4	AH
UZGNVV	111.1	107.2	111.1	107.1	109.1	-0.05	10.9	2.3	109.1	-0.05	10.9	2.3	4	LC
VHQ3QU	109.4	109.3	109.4	109.3	109.4	0.02	8.3	0.0 L	109.4	0.02	8.3	0.0 L	4	LJ
VYG8XN	110.8	110.9	109.8	101.0	108.1	-0.34	8.8	4.8	108.1	-0.34	8.8	4.8	4	AH
X2X8BA	106.0	111.7	102.5	109.3	107.4	-0.55	11.4	4.0	107.4	-0.55	11.4	4.0	4	LB
XMH7F6	101.6	101.2 *	101.8	101.0	101.4	-2.30 *	12.0	0.4 L	101.4	-2.30 *	12.0	0.4 L	4	LA
XMxA46	110.3	109.8	113.3	111.0	111.1	0.53	12.0	1.6	111.1	0.53	12.0	1.6	4	RE

Consensus (All Labs) Results										
Wk Mean	109.80	109.21	108.75	109.13	Month Mean	109.28		Grand Mean	109.28	
Avg SDr	10.22	10.67	10.63	10.93	Avg SDr	10.56		Avg SDr	10.56	
SD btwn Labs	4.37	3.96	4.68	4.41	SD btwn Labs	3.43		SD btwn Labs	3.43	
Labs Incl	53	52	54	52	SD btwn Wks	4.10		SD btwn Wks	4.10	
Labs Excl	1	2	0	0	Labs Incl	53		Labs Incl	53	
Labs not Rcvd	0	0	0	2						

Key to Instrument Codes Reported by Participants

AA	Perkins Model A	AH	Perkins Model AH
AX	Perkins Mullen Tester (model not specified)	LA	L&W Bursting Strength Tester
LB	L&W Burst-O-Matic	LC	L&W Autoline
LJ	L&W Bursting Strength Tester J-Type	LZ	L&W (model not specified)
RE	Regmed/Mullen Tester	TB	TMI Monitor/Burst 1000
TP	Technidyne PROFILE/Plus	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 207
Bursting Strength (Mullen), 36 lb Linerboard - 36Z3
 TAPPI Official Test Method T807

Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
2C9MPK	77.2	74.0 *	74.5	75.3	75.3	-1.64	4.0	1.4	76.0	-1.25	4.4	1.1	12	TP
2KEPMQ	72.7 *	80.5 L	82.3	NO DATA	78.5	-0.38	4.4	5.1 H	76.7	-0.95	4.9	3.7	7	LJ
34KJUM	79.8	79.3	75.3	80.5	78.7	-0.29	4.4	2.3	79.0	0.01	4.2	2.4	12	LJ
3XJZZ4	79.4	78.8	77.1	74.3	77.4	-0.80	4.4	2.3	77.9	-0.44	4.8	1.8	12	LA
4HL9T9	76.2	80.6	76.9	74.4	77.0	-0.96	4.7	2.6	76.5	-1.01	4.8	2.1	12	AH
4RB4NH	79.8	77.3	78.5	80.4	79.0	-0.18	4.4	1.4	79.4	0.18	3.7	0.9	12	AH
6RQM9E	84.1	82.4	81.6	83.5	82.9	1.34	3.9	1.1	80.6	0.70	4.3	2.4	12	LC
7WH647	79.9	77.2	80.5	84.0	80.4	0.36	5.0	2.8	77.7	-0.51	5.3	3.6	8	AX
7WHC4C	72.0 *	69.0 XH	69.7 X	70.5 *	70.3	-3.58 X	7.1	1.3	74.5	-1.84	8.0	7.3 H	10	XX
8BUALH	76.7	81.7	79.7	82.2	80.1	0.24	5.9	2.5	79.7	0.32	5.5	2.5	12	LA
8HQ4JG	80.3	79.2	80.6	78.5	79.6	0.07	5.0	1.0	79.8	0.34	5.4	2.0	12	LZ
8WBJMF	85.4	84.5	87.2 *	83.5	85.1	2.22 *	6.0	1.5	81.6	1.08	4.7	3.2	12	LA
96ZMCV	78.8	79.6	81.7 H	80.8	80.2	0.30	6.3	1.3	80.1	0.49	5.7	1.7	12	LA
9CYCTY	75.6	77.7	73.7	78.2	76.3	-1.23	4.7	2.1	76.0	-1.24	5.3	1.7	12	LA
9LACPV	75.3	80.0	82.7	78.3	79.1	-0.15	6.2	3.1	77.4	-0.63	5.5	2.5	10	LC
AZ4HWV	80.1	80.7	78.4	78.2	79.4	-0.04	6.0	1.2	79.0	0.01	5.4	1.9	12	LA
BJEE8E	76.4	80.2	75.8	80.3	78.2	-0.50	4.5	2.4	78.9	-0.02	5.8	2.1	12	LC
CDKYVD	77.9	79.2	78.6	75.0	77.7	-0.70	4.9	1.9	77.9	-0.45	5.2	1.9	10	LA
CJB8MY	82.5	82.5	80.1	79.8	81.2	0.69	4.6	1.5	82.0	1.25	4.9	1.7	12	LA
CPEDVA	77.7	77.5	78.1	79.7	78.2	-0.48	6.3	1.0	77.4	-0.63	5.5	2.7	12	XX
CQPB9R	79.1	79.1	79.8	83.6	80.4	0.37	5.5	2.2	80.3	0.55	5.4	1.7	12	TB
CWDVET	76.2	73.0 *	77.7	75.5	75.6	-1.51	4.9	2.0	76.8	-0.91	5.4	3.0	12	AH
DJML6R	82.1	79.9	80.7	79.9	80.6	0.46	6.0	1.0	81.0	0.87	5.9	1.5	9	LA
E7BK38	81.7 L	79.4	79.2	74.8	78.7	-0.28	5.1	2.9	78.0	-0.41	5.1	2.3	11	LC
E972KV	79.9	78.2	82.2	81.8	80.5	0.42	4.9	1.8	79.4	0.19	5.6	2.6	12	TB
F7VDKW	79.2	80.0 H	79.8	78.3	79.3	-0.05	6.2	0.8	76.4	-1.07	5.4	3.7	12	LZ
GGLP9U	80.9	81.1	86.5 *	80.1	82.2	1.05	4.8	2.9	79.8	0.33	5.4	3.0	12	LA
HD27L3	83.7	78.4	79.5	78.1	79.9	0.18	6.8	2.6	80.9	0.80	6.1	2.0	12	AA
HZD64A	81.0	82.5	86.0	79.5	82.3	1.09	5.8	2.8	80.0	0.43	5.0	2.5	12	AH
HZFPYQ	83.3	82.0	83.5	81.5	82.6	1.22	5.3	1.0	83.2	1.75	6.2	1.7	12	LC
JDX2KY	85.6	83.5	85.2	85.2	84.9	2.11 *	4.2	0.9	85.2	2.61 *	4.4	1.4	12	XX
KMLANL	83.2	115.6 XH	85.4	NO DATA	94.7	5.96 X	9.0	18.1 H	86.5	3.11 X	7.0	10.3 H	10	LZ
KZ8M3G	77.2	72.8 *	78.7	75.7	76.1	-1.31	5.2	2.5	78.0	-0.40	5.8	2.5	12	LC
MDN42Y	81.7	80.9	83.5	80.3	81.6	0.83	5.2	1.4	79.3	0.15	4.6	2.8	10	AX
NCUVDF	76.2	77.2	79.9	76.8	77.5	-0.75	5.0	1.6	79.1	0.06	5.5	9.6 H	10	LC



Containerboard Interlaboratory Testing Program
 Analysis 207
Bursting Strength (Mullen), 36 lb Linerboard - 36Z3
 TAPPI Official Test Method T807

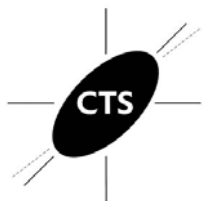
Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
NM9UYB	75.7	80.8	78.0	78.6	78.3	-0.46	4.2	2.1	78.3	-0.27	5.0	1.6	12	LA
P492T3	85.4	84.2	85.5	85.0	85.0	2.17 *	4.8	0.6	85.3	2.64 *	4.7	1.5	8	LC
PQ8KPM	77.6	78.9	77.9	75.1	77.4	-0.81	4.5	1.6	77.3	-0.67	4.2	1.5	12	LA
QB7FRA	78.8	82.0	82.0	80.6	80.9	0.54	3.7	1.5	82.0	1.24	4.8	1.7	12	RE
RWM6MJ	84.7	84.1	84.1	85.7	84.6	2.02 *	5.4	0.8	82.3	1.38	5.3	3.4	12	TB
RZ4BLE	76.7	78.3	75.0	74.3	76.1	-1.32	3.9	1.8	76.3	-1.08	4.6	1.8	12	LC
TCVE3D	79.2	82.4	82.9	78.2	80.7	0.47	4.9	2.3	80.7	0.74	5.4	1.8	8	AH
TV6BL9	80.2	78.3	79.6	78.6	79.2	-0.11	5.9	0.9	80.1	0.49	5.4	1.2	12	LC
TY6RQQ	84.0 H	79.3	79.3	83.5	81.5	0.80	5.9	2.6	82.1	1.29	5.6	2.0	12	AA
U2PZDW	74.9	73.5 *	78.4	73.2	75.0	-1.74	4.0	2.4	75.0	-1.63	4.3	1.5	12	LA
UA6CYA	80.6	81.2	76.4	78.1	79.1	-0.15	5.9	2.2	78.3	-0.25	5.8	1.9	12	AH
UEYALF	81.7	79.5	78.5	78.7	79.6	0.06	5.0	1.5	80.8	0.76	3.6	1.3	12	LA
URP4XA	79.6	77.7	79.2	76.7	78.3	-0.45	5.4	1.3	78.4	-0.22	4.9	1.6	12	AH
UZGNVV	81.8	79.3	77.7	77.9	79.2	-0.11	4.7	1.9	78.1	-0.37	4.9	1.7	12	LC
VHQ3QU	79.3	79.5	79.1	79.2	79.3	-0.07	4.8	0.2 L	79.3	0.15	3.8	0.2 L	12	LJ
VYG8XN	76.4	75.5	75.3	77.7	76.2	-1.26	3.6	1.1	74.5	-1.84	4.6	2.1	12	AH
X2X8BA	75.6	75.7	75.1	75.8	75.6	-1.52	4.2	0.3 L	75.8	-1.30	3.8	1.0	12	LB
XMH7F6	77.7	78.3	75.3	76.0	76.8	-1.03	4.0	1.4	76.7	-0.93	5.1	2.0	12	LA
XMxA46	84.5	81.2	80.7	84.3	82.7	1.26	5.0	2.0	77.9	-0.45	5.8	4.4 H	12	LA

Consensus (All Labs) Results														
Wk Mean	79.50	79.44	79.83	78.96	Month Mean	79.46			Grand Mean	78.96				
Avg SDr	5.15	5.09	4.81	5.33	Avg SDr	5.06			Avg SDr	5.16				
SD btwn Labs	3.27	2.70	3.30	3.40	SD btwn Labs	2.56			SD btwn Labs	2.41				
Labs Incl	54	52	53	52	SD btwn Wks	1.99			SD btwn Wks	2.75				
Labs Excl	0	2	1	0	Labs Incl	52			Labs Incl	53				
Labs not Rcvd	0	0	0	2										

Key to Instrument Codes Reported by Participants

AA	Perkins Model A	AH	Perkins Model AH
AX	Perkins Mullen Tester (model not specified)	LA	L&W Bursting Strength Tester
LB	L&W Burst-O-Matic	LC	L&W Autoline
LJ	L&W Bursting Strength Tester J-Type	LZ	L&W (model not specified)
RE	Regmed/Mullen Tester	TB	TMI Monitor/Burst 1000
TP	Technidyne PROFILE/Plus	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 215

Ring Crush, 42 lb Linerboard - 42D2

TAPPI Official Test Method T822

Report #563 (J)

August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
2C9MPK	87.9	84.1	87.6	87.5	86.8	-0.05	4.6	1.8	86.8	-0.05	4.6	1.8	4	TH
2KEPMQ	86.2	84.6	87.1	90.2	87.0	0.00	4.1	2.3	87.0	0.00	4.1	2.3	4	LD
34KJUM	80.8	83.0	73.6 X	77.2	78.7	-1.63	3.0	4.1	78.7	-1.63	3.0	4.1	4	LC
3F24EJ	88.8	86.1	87.0	88.9	87.7	0.13	4.2	1.4	87.7	0.13	4.2	1.4	4	EM
3XJZZ4	88.0	82.8	83.8	88.6	85.8	-0.24	3.9	3.0	85.8	-0.24	3.9	3.0	4	LZ
4HL9T9	89.6	87.8	88.5	89.7	88.9	0.37	4.4	0.9	88.9	0.37	4.4	0.9	4	EM
7WH647	89.1	88.9	57.0 X	86.8	80.5	-1.28	4.4	15.7 H	80.5	-1.28	4.4	15.7 H	4	LC
8BUALH	96.4	93.6	88.9 H	84.0 H	90.7	0.72	6.6	5.4	90.7	0.72	6.6	5.4	4	LC
8WBJMF	87.2 L	86.6 L	87.4 L	87.9 L	87.3	0.05	1.4	0.6 L	87.3	0.05	1.4	0.6 L	4	LZ
9CYCTY	87.7	88.7	87.0	89.3	88.2	0.23	3.2	1.0	88.2	0.23	3.2	1.0	4	LC
9LACPV	94.1	92.1	92.2	93.6	93.0	1.17	4.0	1.0	93.0	1.17	4.0	1.0	4	LC
AA8FXD	83.6	83.8	81.7	80.8	82.5	-0.89	2.9	1.5	82.5	-0.89	2.9	1.5	4	EX
AZ4HWV	79.9	81.0	81.4	84.1	81.6	-1.06	3.3	1.8	81.6	-1.06	3.3	1.8	4	LD
C684WX	88.2	84.6	89.5	90.8	88.3	0.25	5.4	2.7	88.3	0.25	5.4	2.7	4	LD
CEVYYY	87.0	84.7	84.7	85.9	85.6	-0.28	4.2	1.1	85.6	-0.28	4.2	1.1	4	MB
CJB8MY	88.9	90.1	90.4	92.8	90.6	0.69	3.9	1.6	90.6	0.69	3.9	1.6	4	LZ
CPEDVA	78.5	79.9	84.2	81.0 H	80.9	-1.19	6.0	2.4	80.9	-1.19	6.0	2.4	4	LC
CQPB9R	88.5	89.0	87.4	85.5	87.6	0.11	4.3	1.6	87.6	0.11	4.3	1.6	4	LC
CWDVET	87.0	79.7	91.7	89.6	87.0	0.00	5.0	5.2	87.0	0.00	5.0	5.2	4	LC
D8PRNN	92.0	87.3	88.7 H	89.4	89.4	0.46	6.2	2.0	89.4	0.46	6.2	2.0	4	MB
E7BK38	83.7	90.9	90.2	87.4	88.0	0.20	2.9	3.3	88.0	0.20	2.9	3.3	4	LD
E972KV	75.5 *H	81.6	89.2 H	83.7 L	82.5	-0.88	5.8	5.6	82.5	-0.88	5.8	5.6 H	4	LZ
EPMC3N	92.3	92.2	92.4	92.3	92.3	1.03	3.3	0.1 L	92.3	1.03	3.3	0.1 L	4	WK
F7VDKW	79.7	76.2 *	79.8	77.9	78.4	-1.68	3.8	1.7	78.4	-1.68	3.8	1.7	4	LC
GAKJAH	92.5	92.2	93.6	93.3	92.9	1.15	2.6	0.6	92.9	1.15	2.6	0.6	4	LD
GGLP9U	94.5	97.3	95.9	96.1	96.0	1.74	4.2	1.1	96.0	1.74	4.2	1.1	4	LC
HD27L3	87.2	85.2	85.1	85.4	85.7	-0.26	3.3	1.0	85.7	-0.26	3.3	1.0	4	LD
HTVPGR	82.8	83.1	81.6	85.5	83.2	-0.74	4.3	1.6	83.2	-0.74	4.3	1.6	4	EN
JDX2KY	84.2	77.1	81.1	81.2	80.9	-1.19	4.3	2.9	80.9	-1.19	4.3	2.9	4	LD
KKYF4E	86.0	88.7	90.6	66.4 XH	82.9	-0.80	5.7	11.2 H	82.9	-0.80	5.7	11.2 H	4	XX
KMLANL	84.6	83.2	84.9	No DATA	84.2	-0.54	3.8	0.9	84.2	-0.54	3.8	0.9	3	LC
KRYQHK	90.3	91.8	92.4 L	91.4	91.5	0.87	2.3	0.9	91.5	0.87	2.3	0.9	4	LD
KZ8M3G	90.7	89.9	90.5	91.6	90.7	0.71	4.7	0.7	90.7	0.71	4.7	0.7	4	LC
MDN42Y	93.4	90.6	86.2	94.1	91.1	0.79	4.3	3.6	91.1	0.79	4.3	3.6	4	LZ
MMTD73	73.5 *	75.4 *	72.9 XL	72.7 *	73.6	-2.62 *	2.7	1.2	73.6	-2.62 *	2.7	1.2	4	MB



Containerboard Interlaboratory Testing Program
 Analysis 215
Ring Crush, 42 lb Linerboard - 42D2
 TAPPI Official Test Method T822

Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
NCUVD	92.0	94.9	91.2	89.8	92.0	0.97	5.2	2.1	92.0	0.97	5.2	2.1	4	LC
NM9UYB	97.0	95.8	93.1	95.4	95.3	1.62	3.1	1.6	95.3	1.62	3.1	1.6	4	LD
PQ8KPM	91.7	91.0	88.9	90.3 L	90.5	0.67	2.9	1.2	90.5	0.67	2.9	1.2	4	LD
QB7FRA	81.8	82.4	79.9	80.8	81.2	-1.13	3.5	1.1	81.2	-1.13	3.5	1.1	4	LZ
RUXJAV	77.3	81.3	80.0	82.7	80.3	-1.31	3.4	2.3	80.3	-1.31	3.4	2.3	4	EM
RVBBZR	82.0	79.9	85.8	74.5 *	80.5	-1.26	4.2	4.7	80.5	-1.26	4.2	4.7	4	LC
RWM6MJ	95.8	101.0 *	98.5 *	98.5	98.4	2.23 *	4.4	2.1	98.4	2.23 *	4.4	2.1	4	LX
RZ4BLE	88.4	90.8	88.4	90.0	89.4	0.46	3.8	1.2	89.4	0.46	3.8	1.2	4	LD
TV6BL9	86.6	85.7	88.5	89.6	87.6	0.11	4.2	1.8	87.6	0.11	4.2	1.8	4	LD
U2PZDW	85.0	86.8	85.9	83.7	85.4	-0.33	4.3	1.3	85.4	-0.33	4.3	1.3	4	LD
UEYALF	89.7	89.2	91.6 H	89.4	89.9	0.57	5.1	1.1	89.9	0.57	5.1	1.1	4	LD
URP4XA	83.8	88.1	86.4	84.8	85.8	-0.24	3.4	1.9	85.8	-0.24	3.4	1.9	4	LD
VFZYWN	91.4	91.8 L	90.7 L	96.1	92.5	1.07	2.1	2.4	92.5	1.07	2.1	2.4	4	TD
VHQ3QU	88.0	87.8	88.0 H	87.7	87.9	0.17	4.8	0.2 L	87.9	0.17	4.8	0.2 L	4	LD
VYG8XN	88.7	87.9	87.7 L	89.8	88.5	0.29	3.6	1.0	88.5	0.29	3.6	1.0	4	LC
X2E7LL	97.2	96.7	97.6 *	97.2 L	97.2	1.98	3.0	0.4 L	97.2	1.98	3.0	0.4 L	4	TH
X2X8BA	84.5	89.8	89.1	85.5	87.2	0.04	4.2	2.6	87.2	0.04	4.2	2.6	4	LC
X9Y9Q4	60.8 XL	60.6 XL	60.8 XL	61.1 XL	60.8	-5.12 X	1.1	0.2 L	60.8	-5.12 X	1.1	0.2 L	4	XX
XMxA46	85.9	86.2	82.2	84.7	84.7	-0.44	3.5	1.8	84.7	-0.44	3.5	1.8	4	EM
YMWRP7	81.3	81.9	81.7	75.6 *	80.1	-1.34	3.7	3.0	80.1	-1.34	3.7	3.0	4	LD
Z2694L	93.1	87.4 H	96.5	96.9	93.5	1.26	6.6	4.4	93.5	1.26	6.6	4.4	4	MB
ZK47QN	86.1	82.2	81.8	83.2	83.3	-0.72	3.4	2.0	83.3	-0.72	3.4	2.0	4	EM

Consensus (All Labs) Results														
Wk Mean	87.28	87.00	87.85	87.45	Month Mean	87.02	Grand Mean	87.02						
Avg SDr	3.86	4.09	4.47	4.10	Avg SDr	4.16	Avg SDr	4.16						
SD btwn Labs	5.31	5.37	4.57	5.84	SD btwn Labs	5.12	SD btwn Labs	5.12						
Labs Incl	56	56	53	54	SD btwn Wks	3.47	SD btwn Wks	3.47						
Labs Excl	1	1	4	2	Labs Incl	56	Labs Incl	56						
Labs not Rcvd	0	0	0	1										

Analysis Notes

RVBBZR - Determination #5 for week 2 appeared to be a typo. Removed by CTS.



Containerboard Interlaboratory Testing Program
Analysis 215
Ring Crush, 42 lb Linerboard - 42D2

Report #563 (J)
August 2016

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
EX	Emerson (model not specified)	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LX	L&W 506
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TD	TMI Digital Crush Tester, Model 17-09	TH	TMI Compression Tester, Model 17-76
WK	Zwick Z005 Crush Tester	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 217

Report #563 (J)

August 2016

Ring Crush, 36 lb Linerboard - 36Z3

TAPPI Official Test Method T822

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst							
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks								
2C9MPK	80.4	78.6	78.9	79.0	L	79.2	-0.15	2.8	0.8	80.5	0.06	2.9	1.3	12	TH						
2KEPMQ	78.4	77.8	79.3	80.8		79.1	-0.19	4.0	1.3	79.1	-0.33	3.8	1.0	8	LD						
34KJUM	74.3	73.7	L	72.5	75.3	73.9	-1.44	2.1	1.1	74.1	-1.82	2.2	1.9	12	LC						
3F24EJ	84.1	78.6	82.2	80.0		81.2	0.34	3.6	2.5	80.9	0.20	3.6	2.0	12	EM						
3XJZZ4	79.9	75.3	78.4	60.7	XH	73.6	-1.53	4.9	8.8	H	78.3	-0.58	4.2	6.6	H	12	LZ				
4HL9T9	83.9	80.3	79.4	83.8		81.8	0.49	2.6	2.3	81.7	0.41	2.8	1.8	12	EM						
7WH647	77.4	82.5	76.8	79.4		79.0	-0.19	2.9	2.5	79.2	-0.30	4.0	4.1	8	LC						
8BUALH	90.7	*H	87.4	79.8	H	75.3	H	83.3	0.84	7.2	7.0	H	87.9	2.25	*	5.6	6.0	H	12	LC	
8WBJMF	81.0	81.9	81.9	81.3		81.5	0.41	2.2	0.4	L	82.1	0.55	2.2	1.5	12	LZ					
9CYCTY	80.6	79.4	81.7	81.8		80.9	0.25	2.9	1.1	81.4	0.32	2.8	1.1	12	LC						
9LACPV	86.0	87.1	85.3	85.9		86.1	1.52	3.5	0.8	85.7	1.61	3.4	1.2	10	LC						
AA8FXD	74.1	75.6	75.7	75.4		75.2	-1.13	2.8	0.7	74.0	-1.85	2.3	1.4	12	EX						
AZ4HWV	72.0	73.1	74.2	75.0		73.6	-1.53	2.6	1.3	79.0	-0.36	3.7	6.5	H	11	LD					
C684WX	82.3	79.9	81.4	81.7		81.3	0.36	3.2	1.0	78.4	-0.55	2.5	2.4	12	LD						
CEVYYY	74.1	76.2	77.6	75.9		75.9	-0.96	3.4	1.4	69.3	-3.22	X	4.5	5.2	H	12	MB				
CJB8MY	82.1	80.7	84.2	84.7		82.9	0.75	3.3	1.9	84.2	1.17	3.4	2.3	12	LZ						
CPEDVA	77.3	H	72.6	H	76.0	H	77.0	H	75.7	-1.00	7.5	2.1	79.9	-0.10	5.4	4.7	12	LC			
CQPB9R	82.2	H	79.6	79.1	82.7	80.9	0.26	3.6	1.8	79.2	-0.33	4.2	2.4	12	LC						
CWDVET	83.4	77.6	84.8	82.2		82.0	0.53	2.9	3.1	82.3	0.59	2.6	2.2	12	LC						
D8PRNN	81.4	77.8	84.0	81.4		81.2	0.32	3.2	2.5	79.8	-0.13	3.9	2.6	8	MB						
E7BK38	82.3	81.6	79.7	83.1		81.7	0.45	2.4	1.5	82.6	0.70	2.3	3.0	11	LD						
E972KV	68.9	*H	71.8	74.4	H	78.8	73.5	-1.55	5.2	4.2	75.9	-1.27	4.6	3.8	11	LZ					
EPMC3N	82.1	81.2	81.4	82.1		81.7	0.45	2.3	0.5	L	82.2	0.56	3.0	1.7	12	WK					
F7VDKW	72.6	69.7	*	70.1	*	71.8	71.0	-2.14	*	2.8	1.4	77.0	-0.96	2.9	5.2	H	12	LC			
GAKJAH	83.9	83.9	84.6	84.5	L	84.2	1.07	2.0	0.4	L	83.0	0.79	2.2	1.3	12	LD					
GGLP9U	87.3	82.8	79.7	H	88.4	84.6	1.15	4.9	4.0	82.4	0.63	5.2	4.6	12	LC						
HD27L3	79.8	78.8	L	77.2	L	76.3	78.0	-0.45	1.7	1.6	78.4	-0.56	1.9	1.2	12	LD					
HTVPGR	76.5	79.3	76.6	76.6		77.2	-0.63	2.7	1.4	77.8	-0.74	2.8	1.4	12	EN						
JDX2KY	78.7	72.5	75.7	72.9		75.0	-1.19	4.4	2.9	75.9	-1.27	3.7	3.3	12	LD						
KKYF4E	80.1	82.7	83.1	57.0	XH	75.7	-1.00	5.5	12.5	H	81.1	0.25	4.4	7.9	H	12	XX				
KMLANL	81.6	78.9	79.2	No DATA		79.9	0.01	2.4	1.5	80.8	0.16	2.6	2.6	10	LC						
KRYQHK	82.9	81.6	81.1	82.2		81.9	0.51	3.0	0.8	82.6	0.69	2.7	1.4	12	LD						
KZ8M3G	84.7	85.7	87.1	87.4		86.2	1.56	3.0	1.3	82.0	0.50	3.5	3.5	12	LC						
MDN42Y	81.6	82.3	80.7	L	84.6	82.3	0.59	2.8	1.7	83.2	0.86	3.2	2.8	10	LZ						
MMDT73	65.1	X	66.1	X	69.7	*	70.0	*	67.7	-2.96	X	3.5	2.5	72.5	-2.30	*	3.5	6.1	H	8	MB



Containerboard Interlaboratory Testing Program
 Analysis 217
Ring Crush, 36 lb Linerboard - 36Z3
 TAPPI Official Test Method T822

Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
NCUVD	84.1	84.6	82.7	84.4	84.0	1.00	3.2	0.8	83.5	0.95	3.3	1.9	12	LC
NM9UYB	90.2 *	89.9 *	86.4	88.2	88.7	2.15 *	2.6	1.7	87.6	2.17 *	2.9	1.5	12	LD
PQ8KPM	80.9	84.0	81.6	82.7	82.3	0.60	2.8	1.4	81.6	0.40	2.8	1.3	12	LD
QB7FRA	75.0 L	76.5	75.9	76.8	76.0	-0.93	2.0	0.8	81.5	0.36	2.4	5.1	12	LZ
RUXJAV	70.4 *	72.4	76.3	68.2 *H	71.8	-1.95	4.4	3.4	74.5	-1.69	3.8	4.5	12	EM
RVBBZR	73.8	74.1	76.2	65.0 X	72.3	-1.84	3.1	5.0	74.3	-1.75	3.9	3.4	11	LC
RWM6MJ	88.2	90.1 *	85.0	90.9 *H	88.5	2.12 *	5.6	2.6	88.2	2.33 *	5.4	3.2	12	LX
RZ4BLE	82.8	81.2	81.0	81.9	81.7	0.46	3.2	0.8	81.2	0.27	2.8	1.5	12	LD
TV6BL9	80.6	79.5	83.0	81.9	81.2	0.34	3.0	1.5	79.6	-0.18	2.6	1.8	12	LC
U2PZDW	77.6	77.2 H	79.5	77.1	77.8	-0.49	5.1	1.1	78.1	-0.63	4.0	1.1	12	LD
UEYALF	80.2	79.2	79.2	82.3	80.2	0.09	4.1	1.5	77.6	-0.77	3.0	2.4	12	LD
URP4XA	78.1	81.2	80.0	79.1	79.6	-0.06	2.9	1.3	79.6	-0.19	2.6	1.5	12	LD
VFZYWN	81.0	79.2	77.6	79.5	79.3	-0.13	2.5	1.4	77.6	-0.80	2.1	2.3	12	TD
VHQ3QU	80.8	80.9	80.8	81.1	80.9	0.26	3.9	0.1 L	80.8	0.15	3.5	0.2 L	12	LD
VYG8XN	81.2	81.7	84.1	83.4	82.6	0.67	3.0	1.4	82.1	0.53	3.0	2.0	12	LC
X2E7LL	81.4	82.5	80.9	80.4	81.3	0.35	2.4	0.9	81.7	0.44	2.2	0.8	12	TH
X2X8BA	81.4	82.8	81.7	83.8	82.4	0.63	3.1	1.1	80.5	0.08	3.4	2.0	12	LC
X9Y9Q4	54.0 XL	54.2 XL	53.8 XL	54.4 XL	54.1	-6.27 X	1.2	0.2 L	61.3	-5.60 X	2.0	6.5 H	12	XX
XMxA46	76.8	78.8	74.8	80.2	77.7	-0.53	3.0	2.3	79.2	-0.31	2.7	1.8	12	EM
YMWRP7	76.6	75.6	77.3	76.0	76.4	-0.84	2.8	0.7	76.4	-1.13	2.7	0.9	12	LD
Z2694L	83.9	78.4 H	88.9 *	92.2 *	85.9	1.47	4.2	6.0	84.4	1.22	4.2	4.3	12	MB
ZK47QN	79.8	77.4 L	80.2	79.3	79.2	-0.16	2.2	1.3	79.2	-0.33	2.7	2.3	12	EM

Consensus (All Labs) Results													
Wk Mean	80.24	79.55	79.75	80.51	Month Mean	79.84		Grand Mean	80.26				
Avg SDr	3.52	3.59	3.34	3.60	Avg SDr	3.58		Avg SDr	3.40				
SD btwn Labs	4.52	4.37	3.98	4.86	SD btwn Labs	4.11		SD btwn Labs	3.39				
Labs Incl	55	55	56	52	SD btwn Wks	3.03		SD btwn Wks	3.19				
Labs Excl	2	2	1	4	Labs Incl	55		Labs Incl	55				
Labs not Rcvd	0	0	0	1									

Analysis Notes

- RVBBZR - Determination #4 for week 3 appeared to be a typo. Removed by CTS.
- X9Y9Q4 - Determination #2 for week 4 appeared to be a typo. Removed by CTS.

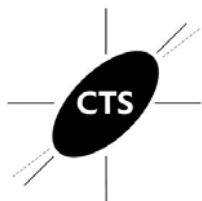


Containerboard Interlaboratory Testing Program
Analysis 217
Ring Crush, 36 lb Linerboard - 36Z3

Report #563 (J)
August 2016

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
EX	Emerson (model not specified)	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LX	L&W 506
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TD	TMI Digital Crush Tester, Model 17-09	TH	TMI Compression Tester, Model 17-76
WK	Zwick Z005 Crush Tester	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 223

Report #563 (J)

August 2016

STFI, 42 lb Linerboard - 42D2

TAPPI Provisional Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
2C9MPK	22.0	22.6	22.2	22.3	22.3	0.00	0.9	0.3	22.3	0.00	0.9	0.3	4	TT
2KEPMQ	22.1 L	23.7 L	22.6 L	No DATA	22.8	0.43	0.0	0.8	22.8	0.43	0.0	0.8	3	LU
3XJZZ4	21.7 L	20.6 L	20.9 L	21.7 L	21.2	-0.84	0.4	0.6	21.2	-0.84	0.4	0.6	4	LA
4RB4NH	22.3	22.1	21.7	22.3	22.1	-0.15	1.0	0.3	22.1	-0.15	1.0	0.3	4	TT
6RQM9E	21.7 L	21.5 L	21.5 L	20.0 L	21.2	-0.88	0.3	0.8	21.2	-0.88	0.3	0.8	4	LA
7WH647	21.3	19.8	21.3	19.0 *	20.4	-1.54	1.7	1.1	20.4	-1.54	1.7	1.1	4	XX
8BUALH	24.7	24.1	25.6 *	24.0	24.6	1.88	1.9	0.7	24.6	1.88	1.9	0.7	4	LU
8HQ4JG	23.7	23.6	23.8	25.3	24.1	1.45	1.8	0.8	24.1	1.45	1.8	0.8	4	LZ
9CYCTY	21.0	20.1	22.0	21.1	21.1	-0.99	1.3	0.8	21.1	-0.99	1.3	0.8	4	LA
9LACPV	24.3 L	23.1 L	23.8 L	25.9 *L	24.3	1.60	0.0	1.2	24.3	1.60	0.0	1.2	4	LA
AZ4HWV	19.2 *	19.3 *	19.3 *	18.8 *	19.1	-2.53 *	1.7	0.2	19.1	-2.53 *	1.7	0.2	4	XX
BJEE8E	24.6	24.1	24.3	25.0	24.5	1.79	2.0	0.4	24.5	1.79	2.0	0.4	4	XX
CDKYVD	24.9 *	26.1 X	24.9 *	25.3	25.3	2.43 *	2.1	0.6	25.3	2.43 *	2.1	0.6	4	LU
CEVYYY	23.9 L	23.6 L	23.6 L	23.0 L	23.5	1.00	0.3	0.4	23.5	1.00	0.3	0.4	4	BK
CJB8MY	20.8	21.1	21.3	21.9	21.3	-0.80	1.7	0.5	21.3	-0.80	1.7	0.5	4	LW
CPEDVA	21.7	20.4	21.9	21.8	21.5	-0.66	2.0	0.7	21.5	-0.66	2.0	0.7	4	LW
CQPB9R	22.0	22.9	22.1	22.2	22.3	0.02	2.0	0.4	22.3	0.02	2.0	0.4	4	LW
CWDVET	23.5	21.7	22.6	21.6	22.4	0.06	1.3	0.9	22.4	0.06	1.3	0.9	4	LY
DJML6R	23.1	22.3	21.5	23.0	22.5	0.18	2.1	0.7	22.5	0.18	2.1	0.7	4	LW
E7BK38	22.1	21.4	22.8	23.6	22.5	0.16	2.4	0.9	22.5	0.16	2.4	0.9	4	LZ
E972KV	21.5	20.9	20.9	22.2	21.4	-0.72	1.7	0.6	21.4	-0.72	1.7	0.6	4	LZ
EPMC3N	23.6	23.6	22.8	23.9	23.5	0.98	1.3	0.5	23.5	0.98	1.3	0.5	4	LZ
F7VDKW	20.9	31.9 X	20.6	19.8	23.3	0.79	2.0	5.8 H	23.3	0.79	2.0	5.8 H	4	LW
FMF4JV	19.6 *L	21.8 L	19.5 *L	20.3 L	20.3	-1.59	0.0	1.1	20.3	-1.59	0.0	1.1	4	LW
GAKJAH	22.0	21.8	21.4	21.3	21.6	-0.52	1.6	0.3	21.6	-0.52	1.6	0.3	4	LY
GGLP9U	19.9 L	19.1 *L	20.5 L	21.6 L	20.3	-1.61	0.0	1.1	20.3	-1.61	0.0	1.1	4	LW
HD27L3	20.4	21.1	20.5	21.1	20.8	-1.20	1.7	0.4	20.8	-1.20	1.7	0.4	4	LW
HTVPGR	20.7	20.6	19.8	20.0	20.3	-1.60	1.8	0.4	20.3	-1.60	1.8	0.4	4	LY
HZFPYQ	24.2	23.7	24.0	25.3	24.3	1.62	2.3	0.7	24.3	1.62	2.3	0.7	4	LA
JHDCVG	21.6	21.1	22.0	22.1	21.7	-0.46	1.8	0.5	21.7	-0.46	1.8	0.5	4	XX
KKYF4E	21.8 L	22.6 L	23.2 L	22.2 L	22.4	0.13	0.1	0.6	22.4	0.13	0.1	0.6	4	XX
KMLANL	22.4	22.0	21.2	No DATA	21.8	-0.35	1.7	0.7	21.8	-0.35	1.7	0.7	3	LW
KRYQHK	21.5	22.1	22.9	24.0	22.6	0.26	1.9	1.1	22.6	0.26	1.9	1.1	4	LY
KZ8M3G	22.9 L	22.1 L	22.2 L	21.9 L	22.3	0.00	0.4	0.5	22.3	0.00	0.4	0.5	4	LA
LKRNN4	45.3 XL	44.5 XL	45.7 XL	41.9 XL	44.4	17.74 X	0.2	1.7	44.4	17.74X	0.2	1.7 H	4	LU



Containerboard Interlaboratory Testing Program

Analysis 223

STFI, 42 lb Linerboard - 42D2

TAPPI Provisional Test Method T826

Report #563 (J)

August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results				Inst	
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks		Wks
NCUVDF	23.0 L	22.8 L	32.0 X	27.3 XL	26.2	3.18 X	0.7	4.4 H	26.2	3.18 X	0.7	4.4 H	4	LA
NM9UYB	23.9	23.9	23.5	23.6	23.7	1.16	1.5	0.2	23.7	1.16	1.5	0.2	4	LA
P492T3	22.7 L	23.1 L	23.8 L	23.4 L	23.3	0.79	0.6	0.5	23.3	0.79	0.6	0.5	4	LA
PQ8KPM	21.9	21.5	21.6	22.3	21.8	-0.36	1.3	0.4	21.8	-0.36	1.3	0.4	4	BK
RZ4BLE	22.3	21.9	22.2	22.5	22.2	-0.03	2.1	0.2	22.2	-0.03	2.1	0.2	4	LA
TCVE3D	22.4	22.0	22.5	21.9	22.2	-0.09	1.9	0.3	22.2	-0.09	1.9	0.3	4	LU
TV6BL9	21.6	23.2	23.3	23.5	22.9	0.48	2.4	0.9	22.9	0.48	2.4	0.9	4	LA
U2PZDW	21.9	21.7	21.8	20.9	21.6	-0.58	2.0	0.5	21.6	-0.58	2.0	0.5	4	LY
UA6CYA	23.7	22.7	22.2	23.1	22.9	0.52	2.0	0.6	22.9	0.52	2.0	0.6	4	LU
URP4XA	23.0	21.1	22.5	22.1	22.2	-0.10	1.9	0.8	22.2	-0.10	1.9	0.8	4	LU
UZGNVV	24.3	21.8	22.9	22.2	22.8	0.39	1.5	1.1	22.8	0.39	1.5	1.1	4	LA
VYG8XN	22.0	22.1	22.4	21.9	22.1	-0.14	1.9	0.2	22.1	-0.14	1.9	0.2	4	LU
X2X8BA	21.6	22.4	22.2	22.2	22.1	-0.13	1.6	0.3	22.1	-0.13	1.6	0.3	4	LU
XMH7F6	22.7	20.9	23.0	23.2	22.4	0.12	1.4	1.0	22.4	0.12	1.4	1.0	4	LW
XMXA46	21.6	22.0	22.7	23.6	22.5	0.16	1.9	0.9	22.5	0.16	1.9	0.9	4	LZ
YMWRP7	21.5	21.6	21.2	21.9	21.6	-0.58	1.7	0.3	21.6	-0.58	1.7	0.3	4	LY
Z2694L	22.3 L	21.6 L	22.9 L	22.6 L	22.4	0.06	0.1	0.6	22.4	0.06	0.1	0.6	4	LA

Consensus (All Labs) Results									
Wk Mean	22.27	21.98	22.23	22.38	Month Mean	22.28	Grand Mean	22.28	
Avg SDr	1.52	1.59	1.66	1.62	Avg SDr	1.61	Avg SDr	1.61	
SD btwn Labs	1.32	1.21	1.30	1.59	SD btwn Labs	1.24	SD btwn Labs	1.24	
Labs Includ	51	49	50	48	SD btwn Wks	1.05	SD btwn Wks	1.05	
Labs Exclcd	1	3	2	2	Labs Includ	50	Labs Includ	50	
Labs not Rcvd	0	0	0	2					

Key to Instrument Codes Reported by Participants

BK	Buchel Strip Compression Tester BK-155	LA	L&W Autoline
LU	L&W 52 without moisture correction(was 53)	LW	L&W 53 with moisture correction (was 53M)
LY	L&W 152 without moisture correction	LZ	L&W (model not specified)
TT	TMI Short Span Compression, 17-34 (MB K455)	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 225
STFI, 36 lb Linerboard - 36Z3
 TAPPI Provisional Test Method T826

Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
2C9MPK	21.4	21.3	21.6	21.4	21.4	-0.09	0.7	0.1 L	21.5	-0.19	0.8	0.2	12	TT
2KEPMQ	22.4 L	22.4 L	21.8	L NO DATA	22.2	0.63	0.0	0.3	21.1	-0.58	0.0	1.2	7	LU
3XJZZ4	21.3 L	20.4 L	20.3 L	19.7 L	20.4	-1.01	0.2	0.7	21.0	-0.64	0.2	0.8	12	LA
4RB4NH	22.0	21.4	21.7	21.9	21.7	0.18	0.7	0.3	21.7	0.09	0.7	0.2 L	12	TT
6RQM9E	20.9 L	21.0 L	20.8 L	20.1 L	20.7	-0.75	0.2	0.4	20.5	-1.14	0.2	0.4	12	LA
7WH647	19.0	20.1	20.8	18.4 *	19.6	-1.76	1.5	1.1	20.2	-1.45	1.3	1.1	8	XX
8BUALH	23.5	23.3	22.4	24.0	23.3	1.61	1.3	0.7	23.3	1.61	1.2	0.8	12	LU
8HQ4JG	22.4	23.6	23.5	23.5	23.2	1.52	1.4	0.5	23.0	1.33	1.4	0.8	12	LZ
9CYCTY	20.7	19.9	20.9	19.7	20.3	-1.11	1.1	0.6	20.4	-1.28	1.0	0.3	12	LA
9LACPV	23.3 L	22.5 L	23.4 L	22.6 L	23.0	1.28	0.0	0.4	23.4	1.80	0.0	0.7	10	LA
AZ4HWV	18.2 *	18.1 *	18.2 *	18.3 *	18.2	-3.00 X	0.9	0.1 L	23.0	1.36	1.2	4.3 H	12	XX
BJEE8E	23.4	23.2	23.6	23.2	23.3	1.62	1.4	0.2	23.1	1.47	1.3	0.6	12	XX
CDKYVD	24.0 *	24.5 *	24.2 *	23.8	24.1	2.33 *	1.6	0.3	22.9	1.27	1.2	1.1	12	LU
CEVYYY	21.4 L	21.3 L	23.5 L	23.8 L	22.5	0.88	0.3	1.3	22.6	0.92	0.2	0.7	12	BK
CJB8MY	20.2	20.3	21.3	21.5	20.8	-0.64	1.2	0.7	21.1	-0.60	1.2	0.7	12	LW
CPEDVA	21.3	20.8	20.8	20.8	20.9	-0.58	1.2	0.2	21.1	-0.55	1.2	0.4	12	LU
CQPB9R	21.7	22.4	21.6	22.2	22.0	0.40	1.6	0.4	22.2	0.50	1.3	0.6	12	LW
CWDVET	20.5	21.3	20.6	21.1	20.9	-0.58	0.5	0.4	22.0	0.36	0.7	1.2	12	LY
DJML6R	22.4	21.8	21.0	21.6	21.7	0.16	1.4	0.6	22.7	1.07	1.4	0.9	11	LW
E7BK38	20.5	21.7	20.8	21.8	21.2	-0.30	1.2	0.6	21.9	0.20	1.4	1.2	11	LZ
E972KV	21.1	21.7	21.1	20.9	21.2	-0.29	1.1	0.4	21.1	-0.57	1.1	0.5	12	LZ
EPMC3N	23.2	22.8	23.1	22.6	22.9	1.26	0.9	0.3	23.0	1.38	0.8	0.2	12	LZ
F7VDKW	19.7	24.2 *	20.0	20.5	21.1	-0.39	1.1	2.1 H	21.5	-0.18	1.3	1.2	12	LW
FMF4JV	20.2 L	19.7 L	19.1 L	20.2 L	19.8	-1.56	0.0	0.5	20.3	-1.38	0.0	0.7	12	LW
GAKJAH	19.7	20.0	20.5	20.8	20.2	-1.16	1.3	0.5	20.8	-0.87	1.3	0.5	12	LY
GGLP9U	19.6 L	20.5 L	19.6 L	20.6 L	20.1	-1.31	0.0	0.6	20.5	-1.13	0.0	0.7	12	LW
HD27L3	19.6	20.1	20.5	20.0	20.0	-1.35	1.2	0.4	20.1	-1.59	1.2	0.2	12	LW
HTVPGR	20.4	19.3	19.8	19.8	19.8	-1.55	1.3	0.4	20.0	-1.68	1.2	0.5	12	LY
HZFPYQ	23.5	23.8	23.8	23.5	23.6	1.89	1.3	0.2	23.6	1.91	1.4	0.3	12	LA
JHDCVG	20.6	20.7	20.8	22.1	21.1	-0.41	1.6	0.7	20.7	-1.00	1.4	0.8	11	LY
KKYF4E	22.0 L	21.5 L	21.9 L	21.6 L	21.8	0.20	0.1	0.2	22.1	0.47	0.0	0.7	12	XX
KMLANL	20.5	20.8	20.7	NO DATA	20.7	-0.78	1.1	0.1 L	20.8	-0.81	1.2	0.3	10	LW
KRYQHK	21.1	21.3	21.9	22.2	21.6	0.09	1.1	0.5	22.0	0.34	1.2	1.1	12	LY
KZ8M3G	21.1 L	22.7 L	21.7 L	21.2 L	21.7	0.13	0.2	0.8	21.7	0.04	0.2	0.6	11	LA
LKRNN4	34.4 XL	34.4 XL	36.5 XL	34.0 XL	34.8	11.98 X	0.1	1.1	26.6	4.91 X	0.7	6.2 H	12	LU



Containerboard Interlaboratory Testing Program
 Analysis 225
STFI, 36 lb Linerboard - 36Z3
 TAPPI Provisional Test Method T826

Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results				Inst	
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks		Wks
NCUVDF	21.9 L	22.0 L	21.9 L	32.0 X	24.4	2.62 *	0.7	5.0 H	24.1	2.46 *	0.8	4.6 H	12	LA
NM9UYB	21.9	22.5	22.7	22.0	22.3	0.67	1.5	0.4	22.1	0.40	1.3	0.4	12	LA
P492T3	21.5 L	21.3 L	22.0 L	23.1 L	22.0	0.39	0.3	0.8	21.8	0.19	0.3	0.6	8	LA
PQ8KPM	20.7	20.5	20.7	21.1	20.7	-0.71	0.9	0.3	20.7	-0.97	1.1	0.4	12	BK
RZ4BLE	22.2	21.9	21.3	22.0	21.9	0.29	1.0	0.4	21.7	0.04	1.3	0.5	12	LA
TCVE3D	21.7	21.1	21.5	22.1	21.6	0.05	1.5	0.4	21.4	-0.23	1.4	0.4	8	LU
TV6BL9	21.7	21.6	22.6	21.8	21.9	0.34	1.5	0.4	22.3	0.70	1.3	0.6	12	LA
U2PZDW	21.4	21.2	21.2	20.2	21.0	-0.49	1.4	0.6	20.7	-0.95	1.3	0.5	12	LY
UA6CYA	22.3	21.5	21.8	22.5	22.0	0.45	1.4	0.5	22.3	0.67	1.4	0.7	12	LU
URP4XA	21.4	21.5	20.7	21.2	21.2	-0.31	1.2	0.4	21.2	-0.44	1.2	0.3	12	LU
UZGNVV	22.2	21.6	22.2	21.9	22.0	0.38	1.3	0.3	21.9	0.23	1.4	0.8	12	LA
VYG8XN	20.9	21.4	21.9	21.4	21.4	-0.12	1.0	0.4	21.3	-0.31	1.3	0.5	12	LU
X2X8BA	21.0	21.5	21.5	20.8	21.2	-0.29	1.4	0.3	21.5	-0.12	1.2	0.3	12	LU
XMH7F6	21.1	20.9	21.6	21.5	21.3	-0.23	0.8	0.3	21.1	-0.54	1.0	0.4	12	LW
XXA46	20.1	20.3	21.9	20.3	20.7	-0.80	1.2	0.8	21.3	-0.34	1.2	0.8	12	LZ
YMWRP7	21.1	21.1	20.8	20.7	21.0	-0.52	1.2	0.2	20.9	-0.73	1.2	0.3	12	LY
Z2694L	21.6 L	21.6 L	20.3 L	21.4 L	21.2	-0.29	0.0	0.6	21.1	-0.54	0.0	0.6	12	LA

Consensus (All Labs) Results									
Wk Mean	21.32	21.45	21.45	21.45	Month Mean	21.53	Grand Mean	21.65	
Avg SDr	1.09	1.11	1.11	1.06	Avg SDr	1.10	Avg SDr	1.08	
SD btwn Labs	1.20	1.24	1.21	1.29	SD btwn Labs	1.11	SD btwn Labs	1.00	
Labs Includ	51	51	51	48	SD btwn Wks	0.93	SD btwn Wks	1.11	
Labs Excl'd	1	1	1	2	Labs Includ	50	Labs Includ	51	
Labs not Rcv'd	0	0	0	2					

Key to Instrument Codes Reported by Participants

BK	Buchel Strip Compression Tester BK-155	LA	L&W Autoline
LU	L&W 52 without moisture correction (was 53)	LW	L&W 53 with moisture correction (was 53M)
LY	L&W 152 (was 52M)	LZ	L&W (model not specified)
TT	TMI Short Span Compression, 17-34 (MB K455)	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 228
Roughness - Stylus Method, 56 lb Linerboard - 56A
 TAPPI Provisional Test Method T575

Report #563 (J)
August 2016

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
3XJZZ4	176.8	0.45	13.9	173.7	0.33	14.5	3	EV
6RQM9E	144.8	-1.11	11.6	148.5	-1.01	11.0	3	EV
84EJ4X	155.5	-0.59	7.7	156.6	-0.58	10.3	2	EV
8BUALH	142.4	-1.23	23.1	144.7	-1.21	18.0	3	LA
8HQ4JG	156.0	-0.57	17.9	165.3	-0.12	19.2	3	LA
9LACPV	159.8	-0.38	12.3	164.9	-0.14	17.6	3	LA
CDKYVD	186.9	0.94	22.1	185.3	0.94	17.6	3	EV
CEVYYY	177.2	0.46	9.3	164.7	-0.15	20.2	2	EV
CJB8MY	180.2	0.61	15.5	181.5	0.74	14.1	3	EV
CWDVET	122.7	-2.18 *	11.7	131.5	-1.91	13.0	3	EV
E7BK38	173.7	0.30	25.5	175.5	0.42	20.8	2	LA
F7VDKW	167.4	-0.01	18.9	168.7	0.06	16.9	3	EV
GGLP9U	171.0	0.16	12.3	182.9	0.82	18.1	3	EV
HTVPGR	151.0	-0.81	11.5	148.5	-1.01	12.7	3	EV
KKYF4E	191.0	1.14	35.1	197.6	1.60	25.4	3	EV
KZ8M3G	201.4	1.64	19.4	211.1	2.31 *	25.9	3	LA
NCUVDF	182.7	0.73	22.4	172.3	0.25	20.2	3	LA
NM9UYB	143.4	-1.18	16.5	149.1	-0.98	17.0	3	XX
U2PZDW	140.2	-1.33	15.3	142.2	-1.34	13.7	3	EV
URP4XA	175.9	0.40	17.0	180.9	0.71	14.8	3	EV
UZGNVV	167.8	0.01	16.8	160.9	-0.35	19.2	3	LA
XMH7F6	199.3	1.54	33.8	164.3	-0.17	23.2	3	EV
Z2694L	188.6	1.02	28.4	182.6	0.80	23.7	3	LA

Consensus (All Labs) Results			
Month Mean	167.64	Grand Mean	167.54
Avg SDr	19.53	Avg SDr	18.19
SD btwn Labs	20.58	SD btwn Labs	18.84
Labs Incd	23	Labs Incd	23

Key to Instrument Codes Reported by Participants

- EV Emveco Microgag Model 210-R
- LA L&W Autoline
- XX Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 229
Roughness - Sheffield Method, 42 lb Linerboard - 42D2
 TAPPI Provisional Test Method T538

Report #563 (J)
August 2016

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
MDN42Y	360.7	-0.52	5.4	379.4	1.55	7.7	4	XX
MP2GZE	368.9	-0.25	6.1	371.5	0.36	5.4	4	XX
P492T3	354.3	-0.73	5.5	364.3	-0.74	7.4	3	XX
RZ4BLE	436.0	2.00 X	1.1	443.1	11.22 X	1.0	4	XX
TV6BL9	369.8	-0.21	8.2	363.1	-0.92	7.7	4	XX
VYG8XN	367.6	-0.29	7.5	367.4	-0.26	7.2	4	XX

Consensus (All Labs) Results				
Month Mean	376.21		Grand Mean	369.12
Avg SDr	6.06		Avg SDr	7.12
SD btwn Labs	29.88		SD btwn Labs	6.60
Labs Incd	6		Labs Incd	5

Key to Instrument Codes Reported by Participants

XX Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 231
Internal Bond, 36 lb Linerboard - 36Z
 TAPPI Provisional Test Method T569

Report #563 (J)
August 2016

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
2KEPMQ	133.5	-1.29	24.4	150.9	-0.25	18.2	2	HZ
7WH647	122.4	-1.77	9.4	120.4	-1.23	6.1	3	SC
8BUALH	150.2	-0.56	6.2	147.3	-0.37	7.0	4	TM
8HQ4JG	158.6	-0.19	3.4	149.6	-0.30	11.0	4	TM
9CYCTY	191.4	1.25	6.1	188.9	0.95	11.3	3	HY
CDKYVD	129.0	-1.48	18.0	126.8	-1.03	11.6	4	TM
CPEDVA	157.2	-0.25	4.4	162.0	0.10	8.5	4	XX
GGLP9U	186.0	1.01	2.2	219.3	1.92	11.2	4	SC
HD27L3	176.4	0.59	4.7	179.0	0.64	6.6	4	TM
KZ8M3G	197.8	1.53	11.5	192.8	1.08	14.1	4	HY
MAQKYZ	161.0	-0.08	5.4	162.8	0.12	4.9	4	TM
P492T3	152.2	-0.47	9.0	152.9	-0.19	7.4	3	SC
RZ4BLE	82.8	-3.50 X	2.1	82.7	-2.43 *	1.4	4	LZ
U2PZDW	185.0	0.97	13.2	159.0	0.00	15.1	4	XX
UEYALF	173.0	0.44	3.4	176.7	0.57	4.1	4	SC
URP4XA	150.6	-0.54	6.8	148.6	-0.33	7.8	4	TM
VYG8XN	182.1	0.84	5.9	182.4	0.75	4.9	4	HY

Consensus (All Labs) Results			
Month Mean	162.90	Grand Mean	158.93
Avg SDr	10.15	Avg SDr	9.85
SD btwn Labs	22.87	SD btwn Labs	31.36
Labs Incl	16	Labs Incl	17

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	159.67	23.26	3.23	13
Modified Scott Bond Mechanics	169.66	17.62	6.76	2

Key to Instrument Codes Reported by Participants

HY	Huygen Digitized Scott Internal Bond Tester	HZ	Huygen Internal Bond Tester with AccuPress
LZ	L&W (model not specified)	SC	Scott Internal Bond Tester (Manual)
TM	TMI Monitor/Internal Bond Tester	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 234
COF Inclined Plane (Slide Angle), 36 lb Linerboard - 36Z
 TAPPI Official Test Method T815

Report #563 (J)
August 2016

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SDr	Mean	CPV	SDr	Months
3XJZZ4	30.4	1.49	2.3	29.6	1.62	2.2	3
8BUALH	26.8	0.01	1.9	26.4	-0.46	3.6	4
8HQ4JG	24.4	-0.97	1.5	28.1	0.65	3.2	4
BJEE8E	22.4	-1.79	1.5	24.6	-1.63	2.0	4
BZY67E	29.3	1.04	0.8	29.0	1.23	1.2	4
CDKYVD	29.2	1.00	0.4	27.2	0.07	2.6	4
CQPB9R	25.8	-0.40	1.8	25.6	-1.00	1.9	4
F7VDKW	28.0	0.51	1.6	26.6	-0.32	1.7	4
GGLP9U	25.0	-0.73	3.2	26.5	-0.38	2.8	4
HD27L3	23.6	-1.29	2.7	25.5	-1.02	3.2	4
HTVPGR	26.2	-0.25	1.7	27.4	0.19	1.7	4
KZ8M3G	29.5	1.13	1.6	28.1	0.62	1.8	4
NM9UYB	25.6	-0.48	1.1	24.8	-1.48	1.4	4
P492T3	26.0	-0.32	1.9	28.1	0.67	1.5	3
RZ4BLE	30.8	1.65	0.8	29.7	1.65	0.8	4
TCVE3D	28.4	0.67	0.7	27.7	0.38	1.1	3
U2PZDW	29.0	0.92	1.2	28.3	0.75	1.7	4
URP4XA	25.8	-0.40	1.9	27.9	0.54	1.7	4
VYG8XN	25.8	-0.40	1.1	24.8	-1.48	1.6	4
XMXA46	23.4	-1.38	1.9	26.2	-0.59	2.1	4

Consensus (All Labs) Results			
Month Mean	26.77	Grand Mean	27.09
Avg SDr	1.71	Avg SDr	2.11
SD btwn Labs	2.44	SD btwn Labs	1.55
Labs Incl	20	Labs Incl	20

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program
Analysis 237

Report #563 (J)
August 2016

Air Resistance, 36 lb Linerboard - 36Z

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
3XJZZ4	51.5	-0.41	3.2	51.4	-0.05	2.3	3	LP
8BUALH	52.9	0.40	1.5	52.7	0.63	1.8	4	LA
8HQ4JG	49.6	-1.42	2.8	47.4	-2.16 *	3.2	4	XX
8WBJMF	50.4	-0.98	2.2	48.7	-1.46	2.5	4	XX
9LACPV	52.6	0.24	4.5	52.4	0.48	3.4	4	TL
BJEE8E	42.6	-5.26 X	1.2	41.7	-5.10 X	1.8	4	LA
BZY67E	55.7	1.91	2.3	54.2	1.41	2.4	4	GA
CDKYVD	45.6	-3.59 X	1.8	44.7	-3.56 X	2.0	4	LA
CEVYYY	55.7	1.91	3.5	55.3	1.97	2.2	3	XX
CQPB9R	52.1	-0.07	1.3	52.7	0.63	2.0	4	LP
GAKJAH	50.5	-0.93	2.0	50.0	-0.82	1.4	4	LP
GGLP9U	53.3	0.60	3.3	51.9	0.20	2.9	4	HG
HD27L3	51.1	-0.59	2.7	51.2	-0.19	2.9	4	HG
JDX2KY	51.9	-0.16	2.1	48.9	-1.39	2.9	4	GG
KKYF4E	51.2	-0.55	2.3	50.1	-0.76	1.8	4	LW
KZ8M3G	50.4	-0.98	1.0	50.5	-0.55	1.6	4	LA
NCUVDF	50.7	-0.84	1.8	50.3	-0.61	2.8	4	LA
NM9UYB	51.4	-0.46	1.5	50.5	-0.54	2.2	4	LA
QGZ7HE	51.8	-0.21	1.8	53.0	0.79	2.2	4	XX
RZ4BLE	52.8	0.34	1.6	53.8	1.19	2.0	4	LA
U2PZDW	53.9	0.93	2.3	53.1	0.84	2.0	4	LP
UEYALF	50.6	-0.88	1.2	50.3	-0.64	1.5	4	LP
VYG8XN	54.2	1.07	3.6	53.3	0.92	3.1	4	TP
XCJ9T6	50.6	-0.88	1.7	51.2	-0.17	1.6	3	LA
XMH7F6	55.8	1.95	3.1	52.1	0.29	2.2	4	LP

Consensus (All Labs) Results			
Month Mean	52.20	Grand Mean	51.52
Avg SDr	2.48	Avg SDr	2.36
SD btwn Labs	1.83	SD btwn Labs	1.92
Labs Incd	23	Labs Incd	23



Containerboard Interlaboratory Testing Program
Analysis 237

Report #563 (J)
August 2016

Air Resistance, 36 lb Linerboard - 36Z

TAPPI Official Test Method T460

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	GG	Gurley Precision #4320 Densometer
HG	Technidyne - Hagerty Model #1 and Profile System	LA	L&W Autoline
LP	L&W Air Permeance Tester SE 166	LW	L&W Gurley Densometer, Oil Flotation
TL	Teledyne Gurley Densometer #4110, Oil Flotation	TP	Technidyne Profile/ plus Roughness & Porosity
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program
Analysis 240

Report #563 (J)
August 2016

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM81

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2C9MPK	58.1	56.5	59.2	57.8	57.9	-0.25	2.2	1.1	57.8	-0.59	2.3	1.7	16	TH
2KEPMQ	67.8 X	64.8 *	61.3 H	64.2 *H	64.5	2.01 *	3.9	2.7	64.5	2.38 *	3.9	2.7	4	LC
34KJUM	59.7	56.9	59.9	56.3	58.2	-0.14	1.8	1.8	58.2	-0.38	1.6	1.3	16	LC
366TC4	60.9	61.5 H	60.1	60.4 L	60.7	0.71	2.8	0.7	61.6	1.09	2.3	1.0	16	LD
4HL9T9	58.3	57.1	63.6	60.4	59.8	0.41	2.8	2.9	60.7	0.71	2.5	1.7	13	EM
4RB4NH	63.1 H	57.5 H	59.5 H	61.3 H	60.3	0.58	4.7	2.4	60.2	0.46	4.6	1.6	16	TG
6YMH7D	59.7	60.2	60.2	60.3	60.1	0.50	1.7	0.3 L	60.6	0.64	1.7	0.6	16	LC
7WH647	57.9	59.5	84.3 X	61.6	65.8	2.45 *	2.6	12.4H	61.2	0.93	3.2	7.4 H	12	LC
8BUALH	61.5	61.1	65.2 *	60.6 H	62.1	1.18	3.7	2.1	59.8	0.30	3.7	2.3	16	LC
9CYCTY	54.5	55.2	54.5	57.0	55.3	-1.14	2.5	1.2	57.3	-0.79	2.2	2.4	12	LC
AZ4HWV	54.9	52.7 *	53.7	55.3	54.2	-1.53	2.7	1.2	56.0	-1.38	2.8	1.6	16	LD
CDKYVD	62.2	55.8	57.1	62.9	59.5	0.30	3.7	3.6	59.8	0.32	3.9	2.7	16	XX
CEVYYY	57.7	56.3	56.5	57.3	56.9	-0.58	3.1	0.7	63.6	1.96	3.2	5.0 H	12	MB
CPEDVA	58.6	57.9	61.1	59.2	59.2	0.19	2.1	1.4	59.1	0.01	2.0	2.6	16	LC
CQPB9R	59.5	62.9	60.9	62.7	61.5	0.98	2.3	1.6	61.5	1.04	2.2	1.4	15	LC
D8PRNN	60.7	60.3	60.9	62.1	61.0	0.81	1.6	0.8	60.8	0.72	2.0	1.4	16	MB
DJML6R	52.1 *	56.4	55.6	55.1	54.8	-1.31	2.8	1.9	55.7	-1.48	3.6	2.1	16	LC
E7BK38	37.5 X	57.2	59.4	56.1	52.6	-2.07 *	2.2	10.1H	56.5	-1.13	2.6	5.6 H	14	LD
E972KV	55.8	53.1	56.5	56.8	55.6	-1.05	2.1	1.7	57.2	-0.82	2.8	2.5	16	LZ
EJYPA4	57.8 H	59.2	59.5	57.1	58.4	-0.08	2.9	1.2	60.0	0.41	2.7	1.4	14	LX
EPMC3N	58.7	58.2	59.0	59.1	58.7	0.04	2.1	0.4 L	59.0	-0.04	1.9	0.5 L	16	LC
FFYT7U	59.6	58.9	58.5	58.3	58.8	0.07	2.5	0.6	59.5	0.15	2.7	0.7	16	LC
HZFPYQ	57.2	56.9	57.4	55.1	56.7	-0.67	2.5	1.1	56.4	-1.21	2.5	1.0	16	LD
JUQRML	59.4	59.6	59.5	59.3	59.5	0.28	1.8	0.1 L	59.3	0.08	2.0	0.3 L	16	LD
KKYF4E	50.0 XH	56.7	54.4	52.8 *	53.5	-1.76	4.3	2.8	54.4	-2.06 *	4.4	5.3 H	15	XX
KMLANL	61.7 L	59.7	59.3	NO DATA	60.2	0.54	1.6	1.3	61.7	1.15	2.0	1.8	14	LE
KRYQHK	59.9	60.8	60.7	60.6	60.5	0.64	2.6	0.4 L	58.2	-0.41	2.2	1.7	16	LD
MMTD73	61.6	62.1	63.1	61.0	61.9	1.13	2.9	0.9	58.4	-0.30	3.0	9.3 H	12	MB
NM9UYB	58.8	58.6	58.1	59.6	58.8	0.06	2.0	0.6	59.3	0.08	2.2	0.8	16	LD
NYPJZ2	51.8 *	51.6 *	51.2 *	51.7 *	51.6	-2.40 *	2.1	0.2 L	53.2	-2.59 *	2.4	1.4	12	TC
PWU9LD	59.0	59.8	60.8	60.4	60.0	0.46	2.0	0.8	57.8	-0.56	2.2	2.0	16	EM
QB7FRA	53.8 H	55.6 H	55.1 H	56.3 H	55.2	-1.18	4.9	1.0	62.4	1.45	3.8	6.6 H	16	XX
QGC3NJ	60.2	59.2	58.6	58.4	59.1	0.16	2.5	0.8	59.4	0.15	2.6	0.8	16	LD
QGZ7HE	59.9 L	60.1	58.3 L	61.3	59.9	0.43	2.0	1.2	60.5	0.61	2.2	1.3	16	LD
RWM6MJ	58.1	57.6	58.5	55.7	57.5	-0.39	1.9	1.2	55.9	-1.39	2.3	1.6	16	LD



Containerboard Interlaboratory Testing Program
Analysis 240

Report #563 (J)
August 2016

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM81

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
RZ4BLE	53.3	53.1	54.8	53.7	53.7	-1.67	2.3	0.7	55.9	-1.42	2.2	1.6	16	LD
T4WVJU	60.3	60.2	59.5	59.3	59.8	0.40	2.7	0.5	60.3	0.54	2.5	1.0	16	LC
TCVE3D	58.3	58.8	58.4	L 58.4	58.5	-0.05	1.4	0.2 L	58.7	-0.19	1.4	0.8	12	LZ
U2PZDW	55.8	55.1	57.1	57.7	56.4	-0.76	2.6	1.2	58.2	-0.39	2.6	1.9	14	LZ
URP4XA	58.0	55.9	56.4	57.9	57.1	-0.54	2.5	1.1	57.9	-0.54	2.5	1.3	16	LD
VFZYWN	63.2	61.3	65.3	*L 61.5	62.8	1.43	1.4	1.8	62.7	1.56	1.3	1.8	16	TD
VHQ3QU	59.5	59.4	59.1	59.3	59.3	0.23	2.4	0.1 L	59.4	0.11	3.0	0.1 L	12	LD
VU63K3	59.5	59.6	59.0	58.5	59.2	0.18	2.6	0.5	59.3	0.08	2.5	1.7	16	MB
VYG8XN	60.2	60.0	61.4	61.9	60.9	0.77	3.1	0.9	60.3	0.50	2.7	1.1	16	LC
X2X8BA	60.1	58.3	60.1	59.4	59.5	0.29	2.0	0.8	59.3	0.09	2.1	1.0	16	LD
XCJ9T6	62.6	63.2	62.3	60.6	62.2	1.20	2.8	1.1	61.6	1.10	2.4	1.5	12	LC
XMH7F6	59.3	59.5	60.5	59.8	59.8	0.39	3.2	0.5	59.6	0.21	3.3	1.0	16	LD
XXA46	55.4	57.3	56.4	55.9	56.2	-0.82	2.4	0.8	57.7	-0.63	2.4	1.5	16	LZ
Z2694L	58.8	56.4	L 55.8	58.4	57.4	-0.44	2.1	1.5	57.9	-0.55	2.8	1.9	16	MB

Consensus (All Labs) Results										
Wk Mean	58.63	58.28	58.82	58.67	Month Mean	58.63	Grand Mean	59.11		
Avg SDr	2.57	2.66	2.64	2.64	Avg SDr	2.67	Avg SDr	2.70		
SD btwn Labs	2.71	2.75	2.86	2.69	SD btwn Labs	2.94	SD btwn Labs	2.28		
Labs Incl	46	49	48	48	SD btwn Wks	2.66	SD btwn Wks	2.78		
Labs Excl	3	0	1	0	Labs Incl	49	Labs Incl	49		
Labs not Rcvd	0	0	0	1						

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LE	L&W CRUSH TESTER 275
LX	L&W 506	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	TC	TMI Monitor/Compression Tester, 17-37
TD	TMI Digital Crush Tester, Model 17-09	TG	TMI Compression Tester, Model 17-10
TH	TMI Compression Tester, Model 17-76	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
Analysis 250

Report #563 (J)
August 2016

Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium - CM81

TAPPI Official Method T824

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
366TC4	70.9	70.3	69.1	69.0	69.8	0.30	2.9	0.9	69.8	0.39	2.5	1.0	16	LD
8WBJMF	68.3	67.5	70.2 H	68.0	68.5	-0.36	3.4	1.2	68.4	-0.14	2.2	0.9	16	XX
CQPB9R	70.8	71.1	69.9	71.7	70.9	0.81	1.9	0.8	69.9	0.41	2.3	2.3	16	XX
E972KV	68.7	69.8	63.5 *H	69.1	67.8	-0.70	3.1	2.9 H	68.0	-0.29	3.3	3.0	16	LZ
EJYPA4	69.6	69.3	69.5	68.8	69.3	0.04	2.2	0.4	65.9	-1.06	3.2	5.5 H	14	LD
FFYT7U	68.0	67.9	68.7	68.1	68.2	-0.52	1.7	0.4	67.1	-0.63	3.3	1.2	12	XX
JUQRML	69.6	69.9	70.1	69.8	69.8	0.31	1.9	0.2	69.3	0.20	2.0	0.5	16	LD
KMLANL	65.9	68.7	70.2	No DATA	68.3	-0.46	2.2	2.2	66.2	-0.97	2.1	2.4	14	LE
MMTD73	60.0 X	56.8 X	57.2 X	57.0 X	57.8	-5.56 X	2.0	1.5	57.4	-4.22 X	3.3	1.4	12	MB
NM9UYB	66.3	66.9	66.9	67.0	66.8	-1.18	1.8	0.3	66.4	-0.88	1.9	0.6	16	LD
QGC3NJ	67.9	68.1	67.7	68.6	68.1	-0.55	1.6	0.4	66.9	-0.71	3.0	1.3	12	XX
QGZ7HE	69.7	71.6	69.7	70.5	70.4	0.55	1.8	0.9	70.2	0.50	1.9	0.7	16	XX
RZ4BLE	70.8	69.7	71.0 L	70.1	70.4	0.57	2.5	0.6	71.3	0.93	2.2	1.4	16	LD
VFZYWN	68.9 L	70.1	70.1	70.4 L	69.9	0.32	1.4	0.7	71.0	0.81	1.1	1.5	16	TD
VYG8XN	71.7	69.9	71.3	72.1	71.2	0.98	1.6	0.9	70.9	0.76	2.1	1.2	16	LC
X2X8BA	65.3	65.1 *	64.4	63.5 X	64.6	-2.25 *	1.7	0.8	64.2	-1.70	1.7	1.1	16	LD
XMH7F6	74.2 *	73.4 *	73.7	73.3 *	73.6	2.15 *	2.3	0.4	75.2	2.36 *	2.1	1.3	16	XX

Consensus (All Labs) Results									
Wk Mean	69.16	69.33	69.11	69.74	Month Mean	69.21		Grand Mean	68.79
Avg SDr	2.10	1.99	2.69	1.90	Avg SDr	2.20		Avg SDr	2.39
SD btwn Labs	2.28	1.97	2.52	1.74	SD btwn Labs	2.06		SD btwn Labs	2.70
Labs Includ	16	16	16	14	SD btwn Wks	1.11		SD btwn Wks	2.02
Labs Exclcd	1	1	1	2	Labs Includ	16		Labs Includ	16
Labs not Rcvd	0	0	0	1					

Key to Instrument Codes Reported by Participants

LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LE	L&W CRUSH TESTER 275	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	TD	TMI Digital Crush Tester, Model 17-09
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program
 Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM81
 TAPPI Official Test Method T822

Report #563 (J)
August 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results						
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst	
2KEPMQ	40.2	38.9	38.8	40.2	39.5	0.39	2.1	0.8	39.5	0.46	2.1	0.8	4	LD	
34KJUM	34.5	35.1	34.5	36.1	35.0	-2.11	*	1.4	0.8	34.9	-0.63	1.2	1.1	16	LC
366TC4	38.4 L	40.4	39.2	39.9	39.5	0.36	1.8	0.9	40.3	0.65	1.6	0.8	16	LD	
6YMH7D	39.9	40.5	39.9	39.8	40.0	0.67	1.9	0.3	40.8	0.77	1.7	0.9	16	LC	
CQPB9R	40.0 H	37.3	36.5	40.6	38.6	-0.12	5.8	2.0	37.8	0.05	3.4	2.2	16	LC	
E7BK38	38.4 L	39.0	38.1	38.6	38.5	-0.17	1.8	0.4	38.2	0.15	2.1	2.0	14	LD	
EPMC3N	42.4	41.9	41.3	42.5	42.0	1.79	1.6	0.6	41.8	1.01	2.2	1.1	16	WK	
KKYF4E	38.2	43.7	40.5	31.8 H	38.6	-0.14	3.2	5.0 H	39.9	0.56	2.6	2.6 H	15	XX	
MMTD73	30.2	31.5	31.2 XH	30.1	30.7	-4.51	X	2.6	0.7	30.1	-1.79	2.4	1.6	12	MB
NM9UYB	41.4	43.1	40.6	40.5	41.4	1.43	2.0	1.2	40.7	0.74	2.0	0.9	16	LD	
NYPJZ2	27.6 *	26.9 *	27.6 XH	27.3 *H	27.4	-6.39	X	3.2	0.3	26.8	-2.55 *	3.6	1.6	12	TC
PWU9LD	40.7	41.2 L	39.2	39.8	40.2	0.79	1.5	0.9	40.7	0.73	1.8	0.8	16	LC	
QGZ7HE	37.7	37.4	37.4 H	38.0	37.6	-0.68	2.5	0.3	37.3	-0.07	2.3	0.7	16	LD	
RWM6MJ	39.3	39.6	38.1	38.5 L	38.9	0.03	1.9	0.7	42.0	1.05	2.1	2.0	16	LZ	
RZ4BLE	38.2	37.4	37.5	38.1	37.8	-0.57	2.1	0.4	38.7	0.27	1.8	1.4	16	LD	
T4WVJU	26.9 *	26.8 *	26.9 X	27.1 *	26.9	-6.63	X	1.6	0.1 L	27.0	-2.51 *	1.7	1.8	16	XX
U8X4N6	37.9	38.1	39.1	39.2	38.6	-0.14	2.9	0.7	37.6	0.00	2.6	1.7	16	LZ	
UBDQYN	36.4 L	35.5	35.7	36.4 L	36.0	-1.58	1.0	0.4	35.5	-0.49	0.9	0.7	16	WK	
VHQ3QU	38.6	38.4	38.5	38.3	38.4	-0.22	2.2	0.1 L	38.5	0.21	3.3	0.1 L	12	LD	
VYG8XN	42.3	38.6	39.1	39.3	39.8	0.55	1.7	1.7	39.3	0.41	1.8	1.0	16	LC	
X2E7LL	42.1	41.9	41.5	41.0	41.6	1.56	2.0	0.5	39.3	0.40	2.3	2.2	16	TH	
XCJ9T6	37.2	37.9	35.1	37.0	36.8	-1.13	1.7	1.2	38.6	0.25	1.8	1.6	12	LD	
XMxA46	36.5 L	38.8	36.5	38.4	37.5	-0.73	1.3	1.2	38.9	0.32	1.8	1.5	16	EM	

Consensus (All Labs) Results														
Wk Mean	37.60	37.82	38.36	37.32	Month Mean	38.82			Grand Mean	37.58				
Avg SDr	3.10	2.01	1.87	2.16	Avg SDr	2.34			Avg SDr	2.23				
SD btwn Labs	4.25	4.38	1.99	4.22	SD btwn Labs	1.80			SD btwn Labs	4.21				
Labs Includ	23	23	20	23	SD btwn Wks	1.44			SD btwn Wks	1.48				
Labs Exclcd	0	0	3	0	Labs Includ	20			Labs Includ	23				
Labs not Rcvd	0	0	0	0										



Containerboard Interlaboratory Testing Program
Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM81

**Report #563 (J)
August 2016**

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	TC	TMI Monitor/Compression Tester, 17-37
TH	TMI Compression Tester, Model 17-76	WK	Zwick Z005 Crush Tester
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program
Analysis 261

Report #563 (J)
August 2016

STFI, 26 lb Corrugating Medium - CM81

TAPPI Provisional Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2C9MPK	12.9	12.7	13.0	13.2	12.9	0.52	0.6	0.2	13.0	0.54	0.6	0.3	16	TT
6YMH7D	11.9	12.6	13.9	13.7	13.0	0.72	0.6	0.9 H	13.0	0.46	0.6	0.6	16	XX
CEVYYY	12.7 L	13.6 L	12.9 L	12.8 L	13.0	0.64	0.1	0.4	13.4	1.39	0.1	0.7	12	BK
DJML6R	11.9	11.7	11.5 *	11.8	11.7	-1.87	0.7	0.2	13.1	0.69	0.8	1.0 H	16	LW
E7BK38	12.2	12.7	12.6	12.8	12.6	-0.23	0.5	0.3	12.6	-0.60	0.7	0.4	14	LZ
EJYPA4	12.7	13.2	13.2	13.3	13.1	0.84	0.7	0.3	12.8	-0.10	0.7	0.4	14	LB
EPMC3N	13.8 *	13.8	13.8	13.8	13.8	2.18 *	0.5	0.0 L	14.1	3.41 X	0.5	0.2	16	LZ
FFYT7U	12.9	13.1	12.9	12.7	12.9	0.44	0.7	0.2	13.0	0.34	0.7	0.1	16	LB
JUQRLM	13.0	13.1	12.9	13.0	13.0	0.60	0.6	0.1	13.0	0.43	0.6	0.1	16	LA
KKYF4E	13.5 L	12.7 L	13.3 L	13.0 L	13.1	0.84	0.0	0.4	13.3	1.24	0.0	0.5	16	XX
NM9UYB	13.6	13.8	13.1	13.3	13.5	1.51	0.8	0.3	13.2	0.87	0.8	0.3	16	LB
NYPJZ2	12.1 L	12.2 L	12.4 L	12.1 L	12.2	-0.95	0.0	0.2	12.1	-2.11 *	0.0	0.3	12	TS
PWU9LD	11.8	11.6	11.9	11.9	11.8	-1.73	0.6	0.2	12.5	-0.87	0.7	0.6	16	LB
QGC3NJ	13.1	13.0	13.0	12.7	13.0	0.55	0.6	0.2	13.0	0.42	0.7	0.1	16	LB
RZ4BLE	12.1	12.4	12.5	12.6	12.4	-0.52	0.7	0.2	12.7	-0.38	0.9	0.3	16	LA
TCVE3D	12.5	12.3	12.2	12.4	12.4	-0.62	0.8	0.1	12.6	-0.56	0.8	0.3	12	LU
TV6BL9	12.4	11.6	12.5	11.9	12.1	-1.20	0.9	0.4	12.7	-0.43	0.9	0.7	16	LA
U2PZDW	12.5	12.6	12.4	11.5	12.2	-0.86	0.8	0.5	12.3	-1.54	0.8	0.3	16	LB
U8X4N6	13.0	13.2	13.1	13.2	13.1	0.87	0.7	0.1	13.2	0.95	0.8	0.6	16	LA
URP4XA	12.3	12.4	12.4	12.2	12.3	-0.71	0.8	0.1	12.5	-0.85	0.9	0.3	16	LU
VYG8XN	12.9	12.5	13.2	12.7	12.8	0.29	0.7	0.3	12.8	-0.18	0.7	0.2	16	LU
XCJ9T6	12.7	12.3	12.6 L	12.0	12.4	-0.57	0.4	0.3	13.5	1.86	0.6	0.9 H	12	LZ
XMXA46	12.4	12.5	13.0	12.8	12.7	0.00	0.9	0.3	12.9	0.05	0.7	0.6	16	LZ
Z2694L	12.4 L	12.2 L	12.0 L	12.5 L	12.3	-0.75	0.0	0.2	12.2	-1.61	0.0	0.5	16	LA

Consensus (All Labs) Results												
Wk Mean	12.63	12.65	12.75	12.66	Month Mean	12.67	Grand Mean	12.84				
Avg SDr	0.59	0.66	0.65	0.63	Avg SDr	0.63	Avg SDr	0.68				
SD btwn Labs	0.53	0.62	0.56	0.61	SD btwn Labs	0.51	SD btwn Labs	0.37				
Labs Incl	24	24	24	24	SD btwn Wks	0.32	SD btwn Wks	0.50				
Labs Excl	0	0	0	0	Labs Incl	24	Labs Incl	23				
Labs not Rcvd	0	0	0	0								



Containerboard Interlaboratory Testing Program
Analysis 261
STFI, 26 lb Corrugating Medium - CM81

Report #563 (J)
August 2016

Key to Instrument Codes Reported by Participants

BK	Buchel Strip Compression Tester BK-155	LA	L&W Autoline
LB	L&W Model 152	LU	L&W 52 without moisture correction (was 53)
LW	L&W 53 with moisture correction (was 53M)	LZ	L&W (model not specified)
TS	TMI Monitor/STFI Compression Tester, 17-33	TT	TMI Short Span Compression, 17-34 (MB K455)
XX	Instrument make/model not specified by lab		